



MITIGATION PLAN

Final

March 15, 2016

CANDY CREEK MITIGATION SITE

Guilford County, NC
DEQ Contract No. 5794
DMS ID No. 96315

Cape Fear River Basin
HUC 03030002

USACE Action ID No. SAW-2015-01209

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
217 West Jones Street
Suite 3000A
Raleigh, NC 27603

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March 15, 2016

EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) is completing a full-delivery project for the North Carolina Division of Mitigation Services (DMS) to restore, enhance, and preserve a total of 19,636 linear feet (LF) of perennial and intermittent streams in Guilford County, NC. The Candy Creek Mitigation Site (Site) is proposed to generate 15,534 Stream Mitigation Units (SMUs) through the restoration, enhancement, and preservation of Candy Creek and nine unnamed tributaries (UT1C, UT1D UT2, UT2A, UT2c, UT3, UT4, UT5, UT5A).

The Site is located within the DMS targeted local watershed for the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002010020 and NCDWR Subbasin 03-06-01 and is being submitted for mitigation credit in the Cape Fear River Basin HUC 03030002. The Site is located within the Haw River Headwaters Watershed, which is part of DMS' Cape Fear River Basin Restoration Priorities (RBRP). While Candy Creek is not mentioned specifically, this document identifies a restoration goal for all streams within HUC 03030002 of reducing sediment and nutrient pollution to downstream Jordan Lake. The Haw River watershed was also identified in the 2005 NC Wildlife Resources Commission's Wildlife Action Plan as a priority area for freshwater habitat conservation and restoration to protect rare and endemic aquatic fauna and enhance species diversity. No rare and endemic aquatic species have been documented onsite or are proposed for re-establishment onsite as part of the project. The Wildlife Action Plan calls for "support of conservation and restoration of streams and riparian zones in priority areas (acquisition, easements, and buffer)." Restoration at the Site will directly and indirectly address these goals by excluding cattle from the stream, creating stable stream banks, restoring a riparian corridor, and placing land historically used for agriculture under permanent conservation easement. Approximately 85% of the streams within the Site watershed will be restored, enhanced, or preserved. A conservation easement will remove 21 acres from agricultural grazing and crop production usage to protect of the restored riparian corridor in perpetuity.

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 DMS operations and procedures for the delivery of compensatory mitigation.



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1.0 Restoration Project Goals and Objectives

The Site is located in Guilford County, northeast of the Town of Brown Summit (Figure 1). The Site is located in the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002010020 and NCDWR Subbasin 03-06-01 and is being submitted for mitigation credit in the Cape Fear River Basin HUC 03030002. The Site is located within a Targeted Local Watershed (TLW) identified in DMS' 2009 Cape Fear River Basin Restoration Priorities (RBRP) which can be accessed at:

http://portal.ncdenr.org/c/document_library/get_file?uuid=864e82e8-725c-415e-8ed9-c72dfcb55012&groupId=60329

The Site is also identified in the 2005 NC Wildlife Resources Commission's Wildlife Action Plan. No rare and endemic aquatic species have been documented onsite or are proposed for re-establishment onsite as part of the project. The Wildlife Action Plan can be accessed at:

http://www.ncwildlife.org/Portals/0/Conserving/documents/ActionPlan/WAP_complete.pdf

The overarching goals of the proposed stream mitigation project are to provide ecological enhancement and mitigate site water quality stressors that will benefit the receiving waters in the Cape Fear River Basin. This will primarily be achieved by creating functional and stable stream channels, increasing and improving the interaction of stream hydrology with the riparian zone to in turn improve floodplain habitat and ecological function, and restoring a Piedmont Bottomland Forest community as described by Schafale and Weakley (1990) along the stream reaches within open pastures.

The Site will treat almost all of the headwaters of Candy Creek and 47% of the entire 3.1-square mile Candy Creek watershed before it flows into the Haw River. Within the project limits, approximately 85% of the streams will be restored, enhanced, or preserved while approximately 6,775 LF of stream channel currently impacted by cattle will be restored and permanently protected. A conservation easement will remove 21 acres from agricultural grazing and crop production usage to protect of the restored riparian corridor in perpetuity. A primary goal of the RBRP is to restore and maintain water quality as stated in the Jordan Lake Nutrient Management Strategy. Through pre- and post-construction water quality monitoring efforts, the Site presents an opportunity to establish and measure a watershed-level restoration approach for nearly half of the Candy Creek watershed.

Table 1 summarizes how specific goals and expected outcomes will meet the main RBRP goal of restoring and maintaining water quality.

Table 1. Mitigation Goals and Objectives - Candy Creek Mitigation Site

<i>Goal</i>	<i>Objective</i>	<i>Expected Outcomes</i>
Reduce in-stream water quality stressors	Reconstruct stream channels with stable dimensions. Stabilize eroding stream banks. Add bank protection and in-stream structures to protect restored/enhanced streams.	Reduce inputs of fine sediment into streams leading to an enhancement of habitat and water quality in riffles and pools.
Construct stream channels with that are laterally and vertical stable	Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Return a network of streams to a stable form that is capable of supporting hydrologic, biologic, and water quality functions.



<i>Goal</i>	<i>Objective</i>	<i>Expected Outcomes</i>
Improve on-site habitat.	Construct diverse and stable channel form with varied and self-sustainable stream bedform. Install habitat features such as undercut logs, brush toe, wood and stone-based riffles. Establish native stream bank vegetation and shading where none exists.	Aquatic habitat quality will be significantly enhanced.
Exclude cattle from project streams	Install fencing around conservation easements adjacent to cattle pastures.	Greater treatment of overland flow and landscape derived pollutants resulting in a reduction of fecal coliform, nitrogen, and phosphorous. The conservation easements specify fencing and management approaches at cattle crossings to prevent impacts to the stream.
Increase and improve the interaction of stream hydrology with the riparian zone to in turn improve floodplain habitat and ecological function	Reconstruct stream channels with appropriate bankfull dimensions and raise them to the proper depth relative to a functioning floodplain.	Provide temporary water storage and recharge of wetlands and floodplain pools during high flows, create increase groundwater connectivity to overbank floodplain and wetland areas, and promote nutrient and carbon exchange between streams and their floodplains. Reduce shear stress on channels during larger flow events.
Restore and enhance native floodplain forest	Plant native tree and understory species, and treat invasive species in the riparian zone.	Create and improve forested riparian habitats. Reduce competition for native species. Preserve or establish a canopy to shade streams and reduce thermal loadings, and create a source of woody inputs for streams. Reduce flood flow velocities on floodplain and allow pollutants and sediment to settle.
Permanently protect the project site from harmful uses.	Establish a conservation easement on the Site.	Ensure that development and agricultural uses that would damage the Site or reduce the benefits of project are prevented. Due to the size of the Site, true landscape scale benefits will be achieved.

2.0 Project Site Location and Selection

2.1 Directions to Project Site

The Site is located in northeast Guilford County, NC, as shown in Figure 1. The Site is approximately 3 miles northeast of the community of Browns Summit and approximately 15 miles northeast of the City of Greensboro. The project is located in a combination of active pasture, farmland, and forest.

From Greensboro, NC, take US-29 North approximately 12 miles past the community of Browns Summit and Monticello. The north end of the project Site including Candy Creek Reach 3, Candy Creek Reach 4, UT1D, and UT1D may be accessed by Old Reidsville Rd (NC SR 2514). The south end of the project Site including Candy Creek Reach 1, Candy Creek Reach 2, UT2, UT3, UT4, and UT5 can be accessed via Hopkins Rd (NC SR 2700).

2.2 Site Selection and Project Components

The Site has been selected to provide stream mitigation units (SMUs) in the Cape Fear River Basin. The Site was selected based on the current degraded condition of streams and the potential for functional restoration.

The project includes a combination of stream enhancement, preservation, and restoration. The streams proposed for restoration, enhancement, and preservation include Candy Creek and its unnamed tributaries UT1C, UT1D, UT2, UT2B, UT3, UT4, UT5, and UT5A as illustrated on Figures 2a and 2b. Candy Creek was divided into four reaches based on drainage area and restoration approach. UT3, UT4, and UT5 flow into Candy Creek Reach 1 at the top of the project Site. UT2 joins Candy Creek Reach 2 just upstream of the Hopkins Road crossing. UT1C and UT1D flow into Candy Creek Reach 3 just south of the Hopkins Road crossing.

3.0 Site Protection Instrument

The land required for construction, management, and stewardship of this mitigation project includes portions of the parcels listed in Table 2. A template of the site protection instrument, final plats and approval memo from the State Property Office are included in Appendix 1. Figures 2a and 2b show the approximate location of the proposed conservation easement.

Table 2. Site Protection Instrument - Candy Creek Mitigation Site

<i>Landowner</i>	<i>PIN</i>	<i>County</i>	<i>Site Protection Instrument</i>	<i>Deed Book and Page Number¹</i>	<i>Acreage to be Protected</i>
Aniyikaiye, Bamidele and Barbara	8900368021	Guilford	Conservation Easement	TBD	1.26
Bray, Nancy	8900502413	Guilford	Conservation Easement	TBD	0.63
Carr, Darin W. and Tamela P.	8900523123	Guilford	Conservation Easement	TBD	6.96
Chrismon, Bruce H. and Margie L.	8900447926	Guilford	Conservation Easement	TBD	0.71
Chrismon, Elmo	8900552557	Guilford	Conservation Easement	TBD	8.42
Hopkins, Herbert Wallace and Marjorie S.	8900533395	Guilford	Conservation Easement	TBD	3.75
Hopkins, Bryan D.	8900515378	Guilford	Conservation Easement	TBD	6.66
Hopkins, Jefferson Todd and Mary Ann	8900482030 8900476144 8900538916 8900466427	Guilford	Conservation Easement	TBD	23.15
Hopkins, Joe W. and Lisa R.	8900428870	Guilford	Conservation Easement	TBD	7.11
Thacker, Robert K.	8900453431	Guilford	Conservation Easement	TBD	2.04
Wagoner, David G. Sr.	8900403874	Guilford	Conservation Easement	TBD	0.80
Wagoner, David G. Sr. and Sons	8900497477	Guilford	Conservation Easement	TBD	0.25

1. Deed book and page number will be added once easements are recorded which is scheduled for October 2015.

All site protection instruments require 60-day advance notification to the Corps and the State prior to any action to void, amend, or modify the document. No such action shall take place unless approved by the State.

4.0 Baseline Information –Project Site and Watershed Summary

Table 3 presents the project information and baseline watershed information. The watershed areas were delineated using 2-foot contour intervals derived from Light Detection and Ranging (LiDAR) data obtained from the 2007 North Carolina Floodplain Mapping Program. Figure 3 shows the watershed boundaries for the Site and Figure 4 shows the USGS topography.

Table 3. Project and Watershed Information - Candy Creek Mitigation Site

Project County	Guilford
Project Area (acres)	61.5
Project Coordinates	Upstream Project Limits – 36°13'27.27"N, 79°39'37.79"W Downstream Project Limits – 36°14'39.74"N, 79°39'50.46"W
Physiographic Region	Inner Piedmont Belt of the Piedmont Physiographic Province
Geologic Unit	Granitic Rock (PPg)
Ecoregion	Northern Inner Piedmont
River Basin	Cape Fear
USGS HUC (8 digit, 14 digit)	03030002, 03030002010020
NCDWR Sub-basin	03-06-01

Reaches	Candy Creek (Reaches 1-4)	UT1C	UT1D	UT2	UT2A	UT2B	UT3	UT4	UT5	UT5A
Drainage Area (acres)	937	28	6	63	15	24	79	190	137	45
Drainage Area (square miles)	1.46	0.04	0.01	0.10	0.02	0.04	0.12	0.30	0.21	0.07
	NCCGIA Land Cover Classification ¹									
Developed	5%	10%	0%	10%	16%	16%	4%	2%	2%	1%
Forested/Scrubland	29%	18%	7%	17%	22%	1%	22%	29%	25%	21%
Agriculture/Managed Herb.	66%	72%	93%	72%	62%	83%	74%	69%	72%	78%
Watershed Impervious Cover	1%	1%	< 1%	3%	5%	3%	1%	0%	1%	< 1%

¹ Percentages by class rounded to nearest whole percentage – as a result, percentages may not sum to 100%.

4.1 Watershed Historical Land Use and Development Trends

Land use within the Site's watershed is historically rural and dominated by agriculture and forest and is currently approximately 66% agriculture and 29% forested. A review of historical aerials from 1949 to present verified that land use on the Site and in the watershed has remained relatively consistent for the past 65 years (historic aerial photos are included in Appendix 2). The limits of pastureland, cropland, and forest have not changed significantly over that time.

Between July and October 2014, Wildlands conducted a watershed assessment to verify current land uses observed from the aerial photography and to identify potential stressors. Most of the watershed is contained within parcels of participating property owners or viewable from public roads, which allowed for a comprehensive assessment. Land use within the watershed was found to be consistent with recent aerial photography. Minor disturbances observed along the watershed boundary consisted of grading operations for a house. There are no evident signs of impending land use changes or development pressure within the watershed that would impact the project.

The project Site captures over 90% of the channel length for each of the mapped streams, meaning there is very little channel length upstream of the project that has the potential to produce sediment supply. In addition, 6 of the 10 headwater tributaries to Candy Creek have on-line farm ponds upstream of the project limits which capture the majority of fine sediment delivered to that point. While agricultural practices contribute a portion of fine sediment to the stream channels, livestock access, on-site channel degradation, and on-going erosion of dam breaches from historic ponds, are the foremost sources of sediment in the system. The Conservation Easement to be placed around the Site will eliminate potential for future development or agricultural use in the immediate vicinity of the on-site streams and provide a significant improvement in the capture and treatment of upland erosion, and pollutant inputs from agricultural sources.

4.2 Physiography, Geology, and Soils

The Site is located in the Carolina Slate Belt of the Piedmont physiographic province. The Piedmont is characterized by gently rolling, well-rounded hills with long low ridges, with elevations ranging anywhere from 300 to 1500 feet above sea level. The Carolina Slate Belt consists of metamorphosed igneous and sedimentary rock including gneiss and schist that has been intruded by younger granitic rocks (NCGS, 2013). The underlying geology of the proposed restoration Site is mapped as Pennsylvanian to Permian age (265 to 325 million years in age) granitic rock (PPg) (NCGS, 1985). This unit is described as megacrystic to equigranular. There are several instances of shallow, exposed bedrock throughout the Site, both in the channels and floodplain.

Soil mapping units are based on the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey of Guilford County. Soils in the project area floodplain and adjacent uplands are mapped as Casville sandy loam, Clifford sandy clay loam, Codorus loam, Nathalie sandy loam, and Poplar Forest sandy loam. These soils are described below in Table 4. A soils map is provided in Figure 5.

Table 4. Site Soil Types and Descriptions - Candy Creek Mitigation Site

<i>Soil Name</i>	<i>Location</i>	<i>Description</i>
Casville sandy loam, 6 - 10% slopes	Mapped along UT2, UT2A, and UT2B.	Casville soils at 6-10% slopes are found on hillsides of ridges. They are well drained with moderately high permeability. These deep soils are typically not flooded.
Clifford sandy clay loam, 6 - 10% slopes	Mapped along Candy Creek Reaches 3 and 4.	Clifford sandy clay loam at 6-10% slopes are found on interfluves at the top of slopes. They are well drained with moderately high permeability. This soil is typically not flooded.
Codorus loam, 0-2% slopes	Mapped along Candy Creek Reaches 1 – 4, UT4, and UT5.	Codorus loam soils consist of nearly level, very deep, somewhat poorly drained soils. They are typically found in floodplain areas. Shrink swell potential is low. These soils are frequently flooded.
Nathalie sandy loam, 2- 6% slopes	Mapped in the upland areas of Candy Creek Reaches 1 – 3, UT1D, UT2, UT3, UT4, and UT5.	Nathalie sandy loam is typically found on interfluves at the top of slopes. This deep, well-drained soil has moderately high permeability and doesn't experience flooding.
Nathalie sandy loam, 6-10% slopes	Mapped along the stream corridor of Candy Creek Reaches 1 – 3, UT1C, UT1D, UT2, UT3, UT4, and UT5.	Nathalie sandy loam is a deep, well-drained soil has moderately high permeability.
Poplar Forest gravelly sandy loam, 15-35 % slopes	Mapped along Candy Creek Reaches 3 and 4.	Poplar Forest soils are found on hillslopes of ridges. They are well drained and consist of residuum derived from mica schist and/or other micaceous metamorphic rock. This soil is very deep with a moderately high permeability. Poplar Forest soils are not frequently flooded.

Source: Web Soil Survey, USDA-NRCS; <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

4.3 Valley Classification

The Site is located in the Piedmont Region and the surrounding landforms are typical of this region. The stream valleys of the headwater streams are steeper, while Candy Creek is a lower-gradient stream. The stream valleys exhibit narrow to moderate floodplain widths, with valley slopes ranging from 0.64% to 7.60% and valley side slopes ranging from 7% to 16%. The valley widths of Candy Creek, UT3, UT4, and UT5 vary from 50 feet to 200 feet with valley slopes falling between 0.64% and 1.60%. The valleys of the smaller tributaries (UT1C, UT1D, UT2, UT2A, and UT2B) are narrower and steeper, with limited floodplain access, ranging from 2% to 7.6%. Several manmade valley constrictions are evident throughout the Site, including farm ponds, old road crossings, and breached earthen dams. The surrounding fluvial and morphological landforms fit most closely to a valley type VIII, Alluvial Fill, according to the Rosgen valley classification system.

4.4 Surface Water Classification and Water Quality

Between August 11 and 14, 2014, Wildlands investigated on-site jurisdictional waters of the U.S. using the U.S. Army Corps of Engineers (USACE) Routine On-Site Determination Method. This method is defined in the 1987 Corps of Engineers Wetlands Delineation Manual and subsequent Eastern Mountain and Piedmont Regional Supplement. Determination methods included stream classification utilizing the North

Carolina Division of Water Resources (NCDWR) Stream Identification Form. Additional stream assessment was performed with the USACE Stream Quality Assessment Worksheet. Potential jurisdictional wetland areas as well as typical upland areas were classified using the USACE Wetland Determination Data Form (refer to Section 5.0 below for more information on jurisdictional wetlands).

The results of the on-site field investigation indicate that there are nineteen jurisdictional stream channels located within the proposed project area including Candy Creek and several unnamed tributaries to Candy Creek (UT1C – UT5A and S1 – S9). Figures 6a and 6b show the hydrologic features on the Site. Stream classification forms representative of on-site jurisdictional channels are including in Appendix 3 (SCP1-SCP23). NCDWR assigns best usage classifications to State Waters that reflect water quality conditions and potential resource usage. Candy Creek (NCDWR Index No. 16-5) has been classified as Water Supply V (WS-V) waters with a supplemental classification of Nutrient Sensitive Waters (NSW) which recognizes waters needing additional nutrient management.

4.5 Reach Summary

On-site existing conditions assessments were conducted by Wildlands between July and August 2014. The purposes of the assessments were to characterize the existing morphology of the Site; identify problems such as incision, bank erosion, lack of native vegetation, sedimentation, and poor habitat conditions; and to provide a basis for developing a design to enhance the ecological function of the Site. The locations of the project reaches and surveyed cross sections are shown in Figures 6a and 6b. Existing geomorphic survey data is included in Appendix 5. Tables 5a and 5b present the reach summary information.

Table 5a. Reach Summary Information - Candy Creek Mitigation Site

	Candy Creek - Reach 1	Candy Creek - Reach 2	Candy Creek - Reach 3	Candy Creek - Reach 4
Restored Length (LF)	2,630	2,212	2,162	3,562
Valley Type	VIII	VIII	VIII	VIII
Valley Slope (feet/ foot)	0.0108	0.0074	0.0066	0.0064
Drainage Area (acres)	560	694	809	937
Drainage Area (square miles)	0.88	1.08	1.26	1.46
NCDWR stream ID score	40.5	40.5	45	45
Perennial or Intermittent	P	P	P	P
NCDWR Classification	WS-V (NSW)	WS-V (NSW)	WS-V (NSW)	WS-V (NSW)
Rosgen Classification of Pre-Project Reach	G4c	F5	G4c	G4c
Simon Evolutionary Stage	IV	IV	IV	III/IV
FEMA classification	N/A	N/A	N/A	N/A

Table 5b. Reach Summary Information - Candy Creek Mitigation Site

	UT1C	UT1D	UT2	UT2A	UT2B	UT3	UT4	UT5	UT5A
Restored Length (LF)	1,130	385	1,853	349	657	1,493	1,357	1,012	1,047

	UT1C	UT1D	UT2	UT2A	UT2B	UT3	UT4	UT5	UT5A
Valley Type	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII
Valley Slope (feet/ foot)	0.030	0.076	0.030	0.043	0.030	0.016	0.012	0.012	0.031
Drainage Area (acres)	28	6	63	15	24	79	190	137	45
Drainage Area (square miles)	0.04	0.01	0.10	0.02	0.04	0.12	0.30	0.21	0.07
NCDWR stream ID score	35	27.5	34.5	31.5	31.5	36.5	37.5	31.5	33.5
Perennial or Intermittent	P	I	P	P	P	P	P	P	P
NCDWR Classification	C	C	C	C	C	C	C	C	C
Rosgen Classification of Pre-Project Reach	E5b	C5	F5	G5	B5c	G4	G4	F4	N/A
Simon Evolutionary Stage	III	II/III	III/IV	III	III	IV	IV	IV	N/A
FEMA classification	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

4.6 Existing Stream and Vegetation Condition

Geomorphic assessments were conducted for each perennial project reach in July 2014. Data collection included surveying representative cross sections and longitudinal profiles, conducting reach-wide pebble counts, and bed material sampling. Collected data are included in Appendix 5 and summarized in Tables 6a-c below.

Table 6a. Existing Stream Conditions - Candy Creek Mitigation Site

	Notation	Units	Candy Creek - Reach 1		Candy Creek - Reach 2		Candy Creek - Reach 3		Candy Creek - Reach 4	
			Min	Max	Min	Max	Min	Max	Min	Max
stream type			G4c		F5		G4c		G4c	
drainage area	DA	sq mi	0.88		1.08		1.26		1.46	
bankfull discharge	Q	cfs	65		85		93		105	
bankfull cross-sectional area	A _{bkf}	SF	12.1	12.3	23.4	27.9	25.8	27.6	20.4	21.5
average velocity during bankfull event	V _{bkf}	fps	5.3	5.4	3.6	4.3	3.4	3.6	4.9	5.2
Cross-Section										
width at bankfull	W _{bkf}	feet	8.7	9.4	18.2	19.4	15.3	17.6	11.4	14.1

	Notation	Units	Candy Creek - Reach 1		Candy Creek - Reach 2		Candy Creek - Reach 3		Candy Creek - Reach 4	
			Min	Max	Min	Max	Min	Max	Min	Max
maximum depth at bankfull	d_{max}	feet	1.7	1.8	1.8	2.4	2.2	2.4	1.8	2.1
mean depth at bankfull	d_{bkf}	feet	1.3	1.4	1.2	1.5	1.6	1.7	1.5	1.8
bankfull width to depth ratio	w_{bkf}/d_{bkf}		6.2	7.2	11.9	16.2	9.1	11.2	6.4	9.2
low bank height		feet	6.6	6.7	2.4	2.7	4.3	5.1	4.0	4.2
bank height ratio	BHR		3.8	3.9	1.3	2.4	1.8	2.3	1.9	2.3
floodprone area width	w_{fpa}	feet	11	16	27	99+	24	60	61	96
entrenchment ratio	ER		1.2	1.7	1.4	3.2+	1.4	3.9	1.5	1.5
Slope										
valley slope	S_{valley}	feet/foot	0.0108		0.0074		0.0066		0.0064	
channel slope ¹	$S_{channel}$	feet/foot	0.0042	0.013	0.0025	0.0042	0.0044		0.0042	0.0068
Profile										
riffle slope	S_{riffle}	feet/foot	0.0066	0.031	0.0050	0.0098	N/A		N/A	
riffle slope ratio	$S_{riffle}/S_{channel}$		0.9	4.1	2.2	3.9	N/A		N/A	
pool slope	S_{pool}	feet/foot	0.0000	0.0046	0.0000	0.0031	N/A		N/A	
pool slope ratio	$S_{pool}/S_{channel}$		0.0	0.6	0.0	0.7	N/A		N/A	
pool-to-pool spacing	L_{p-p}	feet	19.8	56.9	15.8	67.9	N/A		N/A	
pool spacing ratio	L_{p-p}/w_{bkf}		2	5.8	0.8	3.6	N/A		N/A	
pool cross-sectional area	A_{pool}	SF	15.4		30.5		N/A		23.6	
pool area ratio	A_{pool}/A_{bkf}		1.3		1.1		N/A		1.1	
maximum pool depth	d_{pool}	feet	2.1		2.7		N/A		2.8	
pool depth ratio	d_{pool}/d_{bkf}		1.5	1.6	1.8	2.3	N/A		1.6	1.9
pool width at bankfull	w_{pool}	feet	9.0		18.5		N/A		11.9	
pool width ratio	w_{pool}/w_{bkf}		1.0	1.0	1.0	1.0	N/A		0.8	1.0

	Notation	Units	Candy Creek - Reach 1		Candy Creek - Reach 2		Candy Creek - Reach 3		Candy Creek - Reach 4	
			Min	Max	Min	Max	Min	Max	Min	Max
Pattern										
sinuosity	K		1.27		1.28		1.22		1.18	
belt width	W_{bit}	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander width ratio	W_{bit}/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length	L_m	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length ratio	L_m/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature	R_c	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature ratio	R_c/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Particle Size Distribution from Reach Wide Grab Sample										
	d_{50} Description		very fine gravel		coarse sand		N/A		very fine gravel	
	d_{16}	mm	0.57		silt/clay		N/A		0.3	
	d_{35}	mm	1.4		0.3		N/A		0.7	
	d_{50}	mm	2.4		0.8		N/A		2.2	
	d_{84}	mm	15.3		9.1		N/A		14.0	
	d_{95}	mm	26.0		13.9		N/A		28.3	
	d_{100}	mm	45.0		22.6		N/A		256.0	
¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).										

Table 6b. Existing Stream Conditions - Candy Creek Mitigation Site

	Notation	Units	UT1C		UT1D		UT2 - R1		UT2 - R2		UT2A	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
stream type			E5b		C5		F5		G5c		G5	
drainage area	DA	sq mi	0.04		0.01		0.07		0.10		0.02	
bankfull discharge	Q	cfs	6		2		9		12		4	
bankfull cross-sectional area	A_{bkf}	SF	7.2		3.7		2.4	3	3.3		1.2	
average velocity during bankfull event	V_{bkf}	fps	0.8		0.5		3	3.7	3.6		3.5	
Cross-Section												

	Notation	Units	UT1C		UT1D		UT2 - R1		UT2 - R2		UT2A	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
width at bankfull	w_{bkf}	feet	5.7		6.4		3.1	6.7	5.2		2.8	
maximum depth at bankfull	d_{max}	feet	1.7		1		0.8	1	0.9		0.6	
mean depth at bankfull	d_{bkf}	feet	1.3		0.6		0.4	0.8	0.6		0.4	
bankfull width to depth ratio	w_{bkf}/d_{bkf}		4.5		11.2		4	14.9	8.3		6.6	
low bank height		feet	6.4		1.2		3.4	4.7	3.5		3.4	
bank height ratio	BHR		3.8		1.2		4.3	4.9	3.8		5.7	
floodprone area width	w_{fpa}	feet	11.8		34.2		3.6	8.7	7.4		8.6	
entrenchment ratio	ER		2.1		5.3		1.1	1.3	1.4		3.1	
Slope												
valley slope	S_{valley}	feet/foot	0.030		0.076		0.030		0.020		0.043	
channel slope ¹	$S_{channel}$	feet/foot	0.023		0.01 3	0.35	0.018		0.004	0.025	0.039	
Profile												
rifle slope	S_{rifle}	feet/foot	N/A		N/A		0.003 3	0.11	N/A		N/A	
rifle slope ratio	$S_{rifle}/S_{channel}$		N/A		N/A		0.2	6.9	N/A		N/A	
pool slope	S_{pool}	feet/foot	N/A		N/A		0.000 0	0.0021	N/A		N/A	
pool slope ratio	$S_{pool}/S_{channel}$		N/A		N/A		0.0	0.1	N/A		N/A	
pool-to-pool spacing	L_{p-p}	feet	N/A		N/A		22.1	116.4	N/A		N/A	
pool spacing ratio	L_{p-p}/w_{bkf}		N/A		N/A		5.8	30.5	N/A		N/A	
pool cross-sectional area	A_{pool}	SF	N/A		N/A		2.7		N/A		N/A	
pool area ratio	A_{pool}/A_{bkf}		N/A		N/A		1.1		N/A		N/A	
maximum pool depth	d_{pool}	feet	N/A		N/A		1.1		N/A		N/A	
pool depth ratio	d_{pool}/d_{bkf}		N/A		N/A		2.8		N/A		N/A	
pool width at bankfull	w_{pool}	feet	N/A		N/A		3.2		N/A		N/A	



	Notation	Units	UT1C		UT1D		UT2 - R1		UT2 - R2		UT2A	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
pool width ratio	w_{pool}/w_{bkf}		N/A		N/A		1.0		N/A		N/A	
Pattern												
sinuosity	K		1.06		1.15		1.16		1.23		1.10	
belt width	w_{blt}	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander width ratio	w_{blt}/w_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length	L_m	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length ratio	L_m/w_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature	R_c	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature ratio	R_c/w_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Particle Size Distribution from Reach Wide Grab Sample												
d ₅₀ Description			medium sand	medium sand	very fine sand	N/A		N/A				
	d ₁₆	mm	silt/clay	silt/clay	silt/clay	N/A		N/A				
	d ₃₅	mm	silt/clay	0.1	silt/clay	N/A		N/A				
	d ₅₀	mm	0.3	0.3	0.1	N/A		N/A				
	d ₈₄	mm	9.4	2.9	22.6	N/A		N/A				
	d ₉₅	mm	29.8	5.2	36.7	N/A		N/A				
	d ₁₀₀	mm	90.0	16.0	90.0	N/A		N/A				
¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).												

Table 6c. Existing Stream Condition - Candy Creek Mitigation Site

	Notation	Units	UT2B		UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max	Min	Max
stream type			B5c		G4		G4		F4	
drainage area	DA	sq mi	0.04		0.12		0.30		0.21	
bankfull discharge	Q	cfs	6		14		30		22	
bankfull cross-sectional area	A_{bkf}	SF	1.7		3.9		7.2		6.7	
average velocity during bankfull event	v_{bkf}	fps	3.5		3.7		4.2		3.3	

	Notation	Units	UT2B		UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max	Min	Max
Cross-Section										
width at bankfull	W_{bkf}	feet	3.7		5.8		8.5		9.5	
maximum depth at bankfull	d_{max}	feet	0.7		0.9		1.0		1.0	
mean depth at bankfull	d_{bkf}	feet	0.5		0.7		0.8		0.7	
bankfull width to depth ratio	W_{bkf}/d_{bkf}		8		8.8		10.2		13.4	
low bank height		feet	2.6		4.8		6.4		5.5	
bank height ratio	BHR		3.6		5.4		6.2		5.6	
floodprone area width	W_{fpa}	feet	7.8		7.8		10.5		10.2	
entrenchment ratio	ER		2.1		1.3		1.2		1.1	
Slope										
valley slope	S_{valley}	feet/foot	0.030		0.016		0.012		0.012	
channel slope ¹	$S_{channel}$	feet/foot	0.0280		0.012	0.016	0.0088		0.0092	
Profile										
riffle slope	S_{riffle}	feet/foot	N/A		0.011	0.072	0.011	0.064	0.2	0.12
riffle slope ratio	$S_{riffle}/S_{channel}$		N/A		0.8	5.1	1.3	7.4	2.2	12.9
pool slope	S_{pool}	feet/foot	N/A		0.0000	0.0078	0.0000	0.011	0.0000	0.011
pool slope ratio	$S_{pool}/S_{channel}$		N/A		0.0	0.6	0.0	1.3	0.0	1.2
pool-to-pool spacing	L_{p-p}	feet	N/A		6.4	43.1	12	41.5	9.2	54
pool spacing ratio	L_{p-p}/W_{bkf}		N/A		0.6	4.2	1.1	3.6	0.7	4.2
pool cross-sectional area	A_{pool}	SF	N/A		3.8		7.5		5.2	
pool area ratio	A_{pool}/A_{bkf}		N/A		1.0		1.0		0.8	
maximum pool depth	d_{pool}	feet	N/A		1.1		1.4		1.2	
pool depth ratio	d_{pool}/d_{bkf}		N/A		1.6		1.8		1.7	

	Notation	Units	UT2B		UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max	Min	Max
pool width at bankfull	W_{pool}	feet	N/A		5.1		7.6		7.7	
pool width ratio	W_{pool}/W_{bkf}		N/A		0.9		0.9		0.8	
Pattern										
sinuosity	K		1.21		1.45		1.20		1.38	
belt width	W_{bit}	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander width ratio	W_{bit}/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length	L_m	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
meander length ratio	L_m/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature	R_c	feet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
radius of curvature ratio	R_c/W_{bkf}		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Particle Size Distribution from Reach Wide Grab Sample										
	d_{50} Description		N/A		gravel		fine gravel		gravel	
	d_{16}	mm	N/A		silt/clay		0.3		0.3	
	d_{35}	mm	N/A		0.1		0.5		2.8	
	d_{50}	mm	N/A		10.6		2.8		12.5	
	d_{84}	mm	N/A		22.6		28.5		29.7	
	d_{95}	mm	N/A		41.3		40.6		40.6	
	d_{100}	mm	N/A		64.0		64.0		90.0	
¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).										

4.6.1 ***Candy Creek Reach 1***

Candy Creek Reach 1 enters the Site at the southern property boundary next to a small pond and flows north through a wooded valley. Reach 1 is severely incised for its entire length with mass wasting occurring on approximately 75% of its banks. The reach has moderate sinuosity with sandy bed conditions from active bank erosion occurring along the reach. The result is that Reach 1 has impaired in-stream habitat from siltation and a lack of floodplain connectivity due to the severity of channel degradation. As Candy Creek Reach 1 continues downstream, the dimension widens and the incised condition continues. Remnants of a historic, breached dam exist on the left and right floodplain approximately 430 LF from the upstream project limits. The floodplain is not engaged until the predicted 25-year return interval discharge.

Reach 1 has a forested buffer extending at least 50 feet beyond the stream banks. The vegetation in this buffer is typically a mature community similar to the Southern Piedmont Small Floodplain and Riparian Forest ecotype, bordered by a mature Southern Piedmont Mixed Mesic Forest ecotype. The woody

species observed on Reach 1 include *Acer rubrum* (red maple), *Acer floridanum* (southern sugar maple), *Betula nigra* (river birch), *Carya illinoensis* (pecan), *Carya ovata* (shagbark hickory), *Carya tomentosa* (mockernut hickory), *Celtis laevigata* (sugarberry), *Cornus florida* (flowering dogwood), *Fagus grandifolia* (American beech), *Juglans nigra* (black walnut), *Lindera benzoin* (spice bush), *Liriodendron tulipifera* (tulip poplar), *Magnolia virginiana* (sweetbay magnolia), *Platanus occidentalis* (sycamore), and *Quercus alba* (white oak), among others. Wide abandoned terraces and floodplains have dominant cover of exotic invasive herbaceous plants (e.g. *Microstegium vimineum*, *Vinca minor*, *Lonicera spp.*) in the absence of a dense shrub/vine layer.

4.6.2 Candy Creek Reach 2

Candy Creek Reach 2 begins just downstream of the confluence with UT3. Candy Creek Reach 2 is similar to Reach 1; incised with active scour and localized mass wasting. Candy Creek Reach 2 is over widened with top widths of approximately 19 to 21 feet existing in numerous sections. The overall sinuosity for Candy Creek Reach 2 is moderate. Bed materials consist predominately of a thick sandy layer with isolated sections of bedrock. Reach 2 flows through a wide wooded valley with vegetation similar to Reach 1 and enters an active cattle pasture approximately halfway through its length. Reach 2 continues through the cattle pasture until UT2 enters from the right hillside flowing northwest through the pasture. Cattle have access to the reach for its entire 700-foot length through the pasture. A historic dam or road crossing exists in the middle of the pasture section. This is evidenced by a raised road bed or impoundment in the floodplain and remnants of a concrete structure and pipe in the channel. On average, the floodplain in Reach 2 is not engaged until the predicted 25-year return interval discharge.

While some large woody vegetation exists in the pasture, there is sparse riparian vegetation. Banks and floodplains are trampled by cattle and appear to struggle to support vegetation in the shrub and herbaceous layer. Historic modification of the channel includes remnants of a manmade concrete dam structure. Reach 2 leaves the cattle pasture just downstream of the UT2 confluence and flows into a wooded section with a slightly more established forested buffer. Incision, over widening, and bank scour continues until Reach 2 ends at the easement break at the Hopkins Road bridge. Evidence of attempted grade control using riprap and concrete is present at the bridge crossing. Despite these efforts, the channel has continued to scour underneath the Hopkins Road Bridge which is in the process of being replaced.

4.6.3 Candy Creek Reach 3

Candy Creek Reach 3 begins at the Hopkins Road bridge crossing and flows northwest through a wooded valley and into an active cattle pasture. The majority of the reach contains a forested buffer greater than 50 feet along both banks, with deep-rooted vegetation and mature trees along the tops of bank which have helped reinforce bank stability as the reach has down-cut. Woody species is very similar to that along Candy Creek Reach 1.

Reach 3 is disconnected from the adjacent floodplain as a result of a head cut that has advanced to, and been arrested by, the rock outcropping at the Hopkins Road Bridge (end of Reach 2). Incision has been exacerbated by prior manmade levies present in portions of the reach. The channel is lacking in habitat due to sand deposition throughout the reach. Active bank erosion is present in meander bends, although straight segments exhibit relative stability due to the low slope and influence of deep-rooted vegetation. In meander bends, and in locations where trees have fallen or debris has jammed the channel, widening has occurred and benches have formed at an elevation lower than the original top of bank. On average, the floodplain does not activate for flows lower than the predicted 10-year return interval flow. The long-term trajectory of this channel is to erode laterally, with potential for additional local incision as sporadic bedrock outcroppings are circumvented, until sufficient new floodplain has formed to relieve the main

channel. Reach 3 is receiving large amounts of sediment traveling from the incised and eroded channels upstream, as well as from within the reach. UT1C and UT1D both flow southwest and drain into Candy Creek Reach 3 from the right side of the valley.

4.6.4 Candy Creek Reach 4 (4A & 4B)

Candy Creek Reach 4 (consisting of design Reach 4A & 4B), flows north through an active cattle pasture and continues to the downstream project limits. Numerous cattle access points throughout the reach have limited the herbaceous vegetation growth. Riparian vegetation is sparse to non-existent along the entire reach. The few trees that do exist along the top of bank are being undercut by bank erosion. Reach 4 shows evidence of prior straightening, and the upper portion was cleared and straightened in the mid-1990s for pasture creation. Prior manipulation of the floodplain has left remnant ponds, embankments, and spoil piles that adversely affect floodplain function. The stream and adjacent wetlands are subject to upland erosion from slopes and cattle trails. The bed material consists primarily of sandy deposition, from adjacent and upstream bank erosion, with sporadic bedrock outcroppings. Pools are shallow as they are adversely effected by high sand loading from erosion within the project area. Reach 4 is moderately to deeply incised, and shows signs of reach-wide bank scour, typically through lateral erosion, with occasional areas of mass wasting. On average, the floodplain in Reach 4 is not engaged until the predicted 25-year return interval discharge. The cross-section width varies throughout the reach; the upstream section is relatively narrow while the downstream section is generally over widened. The downstream third of the reach (divided out during design as Reach 4B) has a steeper channel gradient and is less incised in one portion, due in large part to a woody debris jam serving as a temporary knick point, holding back sediment upstream. There are numerous pocket wetlands located along both floodplains throughout the reach.

4.6.5 UT1C

U1C originates at an on-site farm pond and flows southwest through a wooded valley before draining into Candy Creek Reach 3. Storm drainage feeding the pond originates from a 12 inch reinforced concrete pipe and an agricultural ditch that connects to the pond. An ephemeral drainage enters from the right side of the valley just below the pond embankment. This drainage combined with outlet drainage from the pond and falls down a massive headcut which is and will continue to threaten the pond embankment stability until it ultimately fails. On the opposite side of the embankment, at the downstream base of the slope, there is a small seep wetland likely the result of pond seepage. Downstream of the pond, the banks are deeply incised with up to 20-foot high vertical eroding banks, and little potential for self-correction due to the steep valley side slopes and extreme incision. The incision peters out near a relic impoundment that has been breached. Downstream of this, the banks are fairly stable and well vegetated within the downstream half of the stream, which will be preserved.

4.6.6 UT1D

Flow in this intermittent reach originates from a groundwater seep located at the base of a 15-foot sheer bank that has been wallowed out by cattle. This steep bank serves as the flow delineation break for the upstream ephemeral channel which is vertically unstable, as evidenced by the succession of several large headcuts. The small UT1D channel flows from the seep area, through a drained and aggraded pond bed, over a breached pond embankment, and through a sparse buffer to Candy Creek Reach 3. The breached embankment is still acting as a partial impoundment, which causes sediment to settle out and smother stream habitat. As a result, the channel in this section is silted in with no discernable channel. The embankment construction, and subsequent breach, resulted in an eroded channel down the face of the dam which lacks adequate vertical stability and threatens the long-term integrity of the embankment; a

second abandoned breach channel is also present. The confluence with Candy includes a 4-foot vertical knick point that is tenuously held by tree roots. Degraded in-stream habitat is evident throughout much of the reach as a direct result of long-term cattle grazing. Cattle have access to the majority of the reach, especially upstream of the embankment where the channel bed and banks have been trampled, creating wide, shallow, stagnant pools steeped in cattle excrement. Like UT1C, overland flow draining to UT1D is likely to be flashy during storm events due to cleared headwaters, ditched conveyances draining plots of row crops, and the active gulying of the upstream ephemeral channel. Sediment from an unpaved driveway and a tilled field of row crops is entering the channel from the right floodplain terrace in proximity to the breached embankment. The drained and aggraded pond bed was delineated as a wetland during the existing conditions phase.

4.6.7 UT2

UT2 begins in a stand of woods between two pastures on the eastern side of the Site. It flows through an existing cattle pond and into Candy Creek Reach 2 just upstream of Hopkins Road. UT2 is characterized by three reaches: UT2 Reach 1A (approximately 450 LF), UT2 Reach 1B (approximately 350 LF), and UT2 Reach 2 (approximately 1310 LF).

UT2 Reach 1A is the headwaters of UT2 and runs through a narrow, wooded valley. The channel is deeply incised with vertical, eroding banks and several large fallen trees. A headcut is progressing up-valley at the most upstream project limit. The channel bed is relatively flat but does exhibit decent bedform. Cattle do not have access to UT2 Reach 1A.

UT2 Reach 1B begins at the existing fenced woodline and ends at the confluence with UT2 Reach 2. The valley begins to widen out along this reach and is sparsely populated by hardwood trees. Cattle use this area for shade and to access the stream channel. The stream channel becomes less incised as it approaches the confluence and wetland in the downstream section. It exhibits typical signs of cattle impact: trampled banks and bed, low slope, and limited habitat features.

UT2 Reach 2 begins in the wetland just upstream of the existing cattle pond and terminates at Candy Creek. The wetland lies at the upstream edge of the existing cattle pond and most likely formed because of the pond. Cattle have free range in the wetland and it is highly impacted. The stream channel bank height decreases through the wetland before disappearing into the pond. The pond is used as a water source for cattle and was observed to be overtaken with algae on multiple site visits. Pond banks have been degraded by cattle and, with the exception of a single tree, has no woody vegetation. The 14-ft high earthen dam appears to be in fair, stable condition with no visible signs of failure or seeps. UT2A flows into UT2 approximately 180 LF downstream of the dam. Downstream of the confluence, the stream flows between a cow pasture in the left floodplain and woods in the right floodplain. The channel is incised but has fairly stable, vegetated banks. This section also has moderate pattern and the formation of floodplain benches.

4.6.8 UT2A

UT2A (approximately 360 LF) flows down a hillside into UT2 from the north, downstream of the existing pond. At its downstream end, the channel is deeply incised with actively eroding banks. Due to two headcuts, bank height is significantly less at the upstream project limit. Habitat and functionality are limited due to the absence of riffle and pool formation. Vegetation consists primarily of scrubby woody species with invasive blackberry throughout the entire reach. The channel lies within a fairly confined, narrow valley, with the left floodplain being pasture and the right floodplain being agricultural field.

4.6.9 UT2B

UT2B joins into UT2 just upstream of the pond, in the existing wetland. Cattle have access to the entire reach (approximately 700 LF). UT2B begins at a groundwater seep in a pasture and flows through a steep section before flattening out at the downstream end. The channel fluctuates between being slightly incised and not incised throughout the reach. Stream banks have generally been impacted by cattle, with interspersed short sections of fairly intact and stable banks. The channel has established a few sections of pattern that appear to be stable. Most of the channel habitat has been eliminated from cattle influence. The valley is fairly narrow along the upstream half of the reach and widens along the downstream half of the reach. Vegetation consists of a single row of scattered trees along both banks.

4.6.10 UT3

UT3 originates from a farm pond at the southeast end of the project. An outlet could not be located at the downstream end of the pond and the majority of flow exits the pond through seep flow out of the existing embankment. UT3 flows from southeast to northwest in a stable condition for approximately 1,365 LF. The stable portion of UT3 has low bank heights, good connection to the floodplain, and flows through an existing jurisdictional wetland. Downstream of this area, UT3 makes an immediate turn south to circumvent a previously abandoned farm road crossing. The stream flow is split between an embedded 6-inch PVC pipe and the channel that goes around the embankment. Beyond the embankment UT3 turns north and flows toward the main stem of Candy Creek for approximately 700 LF. This section of UT3 appears to have been previously straightened and realigned to the existing toe of the valley wall. The stream is deeply incised, actively eroding, straightened, and isolated from the existing mature wooded floodplain. On average, the floodplain in UT3 is not engaged until the predicted 100-year return interval discharge. Woody vegetation species along UT3 is very similar to the species listed under Candy Creek Reach 1.

4.6.11 UT4

UT4 enters the Site from the west end of project and flows from west to east towards the main stem of Candy Creek for approximately 1,270 LF. UT4 is similar to UT3: severely incised with active erosion including mass wasting. Woody vegetation species along UT4 is very similar to the species listed under Candy Creek Reach 1. On average, the floodplain in UT4 is not activated until the predicted 100-year return interval discharge. Erosion from banks has resulted in long sections of sand runs with limited habitat. Similar to UT3, it appears that UT4 was modified at some point to be straightened and re-aligned to the toe of the valley slope, limiting pattern and floodplain connectivity. A small side channel approximately half way down the existing UT4 enters the stream from the right floodplain. The side channel appears to drain the adjacent hill side and/or be part of a relic channel system. The incision of the side channel as well as UT4 has created a very close proximity for the top of banks of the two channels and is comprising the bank stability for both reaches. Just upstream of the project extents, UT4 is stabilized by a bedrock step feature which will be used as grade control in the proposed design.

4.6.12 UT5 and UT5A

UT5 and UT5A enter the project from the southwest side of the project and flow northeast toward the main stem of Candy Creek. UT5A enters the project from a farm pond and flows north until it meets UT5. UT5A is in preservation condition with good dimension, floodplain connectivity, and bed form habitat. UT5 begins to dramatically incise shortly after the confluence of UT5A and UT5. On average, the floodplain in UT5 is not engaged until the predicted 100-year return interval discharge. Pattern for UT5 is sinuous, with very tight bends that have led to erosion, mass wasting, and lateral instability. Signs of horizontal instability exist within the channel including the development of transverse and lateral bars. Human



manipulation is evident within the floodplain including a historical embankment. The downstream extents of UT5 flow against an existing valley wall which further limits floodplain connectivity. Woody vegetation species along UT5 is very similar to the species listed under Candy Creek Reach 1.

4.7 Channel Evolution

The streams exist in an unnatural condition due to historic and ongoing manipulation, maintenance, and agricultural activities; therefore, reliable bankfull features were difficult to identify. The design bankfull discharge was estimated using methods outlined Section 9.2. This design bankfull discharge was routed through the surveyed cross sections to quantify existing condition bankfull dimensions for descriptive purposes. Existing geomorphic conditions for each reach included in the project are summarized above in Table 6 and the reaches are mapped on Figures 6a and 6b.

Channelization usually includes straightening and deepening of streams and is one of the major causes of channel downcutting or incision (Simon, 1989; Simon and Rinaldi, 2006). Based on Simon's model termed the Channel Evolution Model for Incised Rivers (1989), alluvial streams typically follow a sequential series of evolutionary stages as they respond and ultimately recover from impacts due to channelization or major changes to hydrologic and sediment regime.

Candy Creek Reaches 1 – 3, UT3, UT4, and UT5 appear to be at similar evolutionary stages and all flow through comparable wooded buffers. Headcuts most likely moved through the reaches in the past, creating an incised channel condition with an intact vegetative buffer. Downcutting was most likely exacerbated when historic pond dams were breached, but is now limited due to observed bedrock outcrops. The streams exhibit signs of widening, evidenced by active lateral bank erosion and fallen trees. Floodplain benches have started to form in a few discrete locations where fallen trees have exacerbated channel widening. These reaches are in a Stage IV widening phase.

Candy Creek Reach 4 lacks vegetated buffer and is in a Stage III/IV evolution phase. The upper portion of Reach 4 was cleared, and presumably straightened, in the mid-1990's. The cross sectional area and channel width varies significantly within Reach 4. The combination of livestock access and minimal or no buffer in most areas has led to the present condition. There are several locations of bank wasting due to livestock access while other stretches of stream bank have been packed down due to livestock trails. Existing incision, vegetation maintenance and grazing, as well as livestock trampling will continue to prevent Reach 4 from re-stabilizing. In addition, an arrested 2-foot headcut in the lower third of the reach (near Station 202+90) could fail and accelerate downcutting and widening, upstream through the reach.

The non-impounded section of UT1C, downstream of the existing dam, flows through a steep, narrow, wooded valley. It appears that further bed degradation is possible since there are no signs of bedrock and due to the steeper stream slope. While the banks are vertical and eroding, it does not seem like the widening process has commenced. This reach is in Stage III of the evolutionary process.

The majority of the UT1D reach is influenced by a partially breached dam. A wetland has formed in the old pond bed upstream of the breached dam with a flat and relatively small, and in some places undefined, channel. The breach is a nearly vertical 5-foot drop from the upstream wetland to the downstream channel. Downstream of the breached dam, channel dimension is more consistent along the reach. There is a steep 4-ft drop at the confluence with Candy Creek held by root mass. The downstream portion of the channel appears to be in Stage I; however, the majority of reach located at and above the impoundment is in Stages II and III due to instability from progressive failure of the dam.

Reach UT2 Reach 1 and UT2A are both characterized by active downcutting and steep, eroding banks. Both are situated in narrow, vegetated valleys that inhibit widening and development of sinuosity. There were no signs of bench formation, which further supports that these reaches are in Stage III.

UT2 Reach 2 downstream of the dam is in Stage IV. The incised channel has established some sinuosity and floodplain benches have started to form. While some eroding banks were observed, most the banks along this reach were vegetated with herbaceous species.

UT2B is actively degrading (Stage III). A series of headcuts are progressing up-valley creating incised, vertical banks in the upstream section of the reach. The downstream half of the reach is heavily influenced by cattle, and a few sections of channel appear to be incised and downcut. The planform pattern observed in the downstream section is most likely due to cattle impact and tree root masses as opposed to evolutionary widening processes.

4.8 Channel Stability Assessment

Wildlands utilized a modified version of the Rapid Assessment of Channel Stability as described in Hydrologic Engineering Circular HEC-20 (Lagasse, 2001).

The assessment results for the streams on the Candy Creek Site indicate that most of the streams rated in the second to lowest category – fair, with Candy Creek Reach 2 rated as poor. Parameters that scored poorly include channel pattern, bed material, bank soil texture, bank angle, and bank protection. For Candy Creek Reaches 1 and 4, UT2A, and UT5, the lateral fraction was slightly greater than the vertical fraction. This indicates that lateral instability is a greater problem for these channels than vertical instability. For Candy Creek Reaches 2 and 3, UT1C, UT1D, UT2, UT2B, UT3, and UT4, the vertical fraction was greater than the lateral fraction, indicating that vertical instability and incision is a greater threat than lateral instability. Total scores, stability ratings, and vertical and horizontal fractions are provided in Tables 7a and 7b.

Table 7a. Existing Conditions Channel Stability Assessment Results - Candy Creek Mitigation Site

Parameter	Candy Creek - Reach 1	Candy Creek - Reach 2	Candy Creek - Reach 3	Candy Creek - Reach 4
1. Watershed characteristics	8	10	7	7
2. Flow habit	1	5	3	1
3. Channel pattern	11	9	8	10
4. Entrenchment	10	10	7	6
5. Bed material	9	10	11	12
6. Bar development	7	11	8	8
7. Obstructions	7	8	6	4
8. Bank soil texture and coherence	9	10	10	10
9. Average bank slope angle	11	10	11	11
10. Bank protection	11	10	6	10
11. Bank cutting	11	9	6	9
12. Mass wasting or bank failure	11	9	7	9
Score	106	111	90	97
Rating	Fair	Poor	Fair	Fair
Lateral Fraction	0.88	0.80	0.67	0.82
Vertical Fraction	0.72	0.86	0.72	0.72

Table 7b. Existing Conditions Channel Stability Assessment Results - Candy Creek Mitigation Site

Parameter	UT1C	UT1D	UT2	UT2A	UT2B	UT3	UT4	UT5
1. Watershed characteristics	11	7	7	7	7	6	6	7
2. Flow habit	5	2	2	2	3	4	2	2
3. Channel pattern	9	7	7	6	7	9	8	8
4. Entrenchment	6	9	9	7	5	10	9	8
5. Bed material	12	9	9	9	10	8	7	8
6. Bar development	8	8	8	3	8	5	8	8
7. Obstructions	3	5	5	4	4	6	6	5
8. Bank soil texture and coherence	10	7	7	7	9	10	6	6
9. Average bank slope angle	10	11	11	10	10	10	10	10
10. Bank protection	9	8	8	9	7	6	8	10
11. Bank cutting	7	9	9	6	7	6	7	9
12. Mass wasting or bank failure	7	7	7	5	5	6	7	8
Score	97	89	89	75	82	86	84	89
Rating	Fair							
Lateral Fraction	0.72	0.70	0.70	0.62	0.63	0.63	0.63	0.72
Vertical Fraction	0.72	0.72	0.72	0.53	0.64	0.64	0.67	0.67

4.9 Site Access and Utilities

The project Site is accessible from Hopkins Road. The project includes one external easement crossing, at station 132+15 on Reach 2A, which will be excluded from the easement area and mitigation credit calculations for the Site. There are nine internal stream crossings. The internal crossing areas are included in the easement area, but not included in mitigation credit calculation for the Site. Four of the ten easement crossings will be used for cattle crossings. Two of these (Candy Creek Reach 4 and UT2 Reach 1) will be culverts and the other two crossings (Candy Creek Reach 2 and Candy Creek Reach 4) will be fords. The remaining five non-cattle crossings (Candy Creek Reach 1, Candy Creek Reach 2, Candy Creek Reach 3, UT5, and UT5a) will be used for property owner access. The crossings and fencing exclusions are further discussed in Section 9.5.3.

Although no underground or overhead utilities were observed on the Site, all utilities will be located prior to construction by using location service provided by NC 811. One utility easement crosses the site, but contains no utility within the easement. This utility easement appears to have been established to serve a residential subdivision that was never established. This utility easement has been subordinated to the conservation easement.

5.0 Regulatory Considerations

A Categorical Exclusion has been completed and approved to satisfy federal funding requirements. This package is included in Appendix 7. Table 8 summarizes regulatory considerations for the project.

Table 8. Regulatory Considerations - Candy Creek Mitigation Site

	Applicable?	Resolved?	Supporting Documentation
Waters of the US – Section 404	Yes	PCN prepared	Appendix 3 & 8
Waters of the US – Section 401	Yes	PCN prepared	Appendix 3 & 8
Endangered Species Act	Yes	Yes	Appendix 7

	Applicable?	Resolved?	Supporting Documentation
Historic Preservation Act	Yes	Yes	Appendix 7
Coastal Zone Management Act/Coastal Area Management Act	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	Appendix 7

5.1 401/404

As discussed in Section 4.5, the results of the on-site delineation of jurisdictional waters of the U.S. indicates nineteen (19) jurisdictional channels including Candy Creek and several unnamed tributaries (UT1C, UT1D, UT2, UT2A, UT2B, UT3, UT4, UT5, UT5A, and S1 – S9) within the proposed project area. UT1D, portions of UT2A, UT2B, and UT5A, S1, S2, S4, S5, S7, S8, and S9 were classified as intermittent channels using NCDWR Stream Identification Forms. The remaining project channels were classified as perennial.

Additionally, thirty five jurisdictional wetland areas (Wetland A – K, L – HH, JJ, KK, and MM) (Figures 6a and 6b) were delineated within or immediately adjacent to the proposed project area, totaling 2.18 acres. Jurisdictional wetlands were delineated using the USACE Routine On-Site Determination Method. This method is defined by the 1987 Corps of Engineers Wetlands Delineation Manual and subsequent Eastern Mountain and Piedmont Regional Supplement. Delineated wetlands are considered wetland inclusions in non-wetland soils. On-site wetland features exhibited one or more of the following wetland hydrology indicators: saturation within the upper 12 inches of the soil profile, algal mats, shallow inundation, iron deposits, water-stained leaves, and/or drainage patterns. All wetlands had low chroma soils. Common hydrophytic vegetation found in on-site wetlands included common rush (*Juncus effusus*), Pennsylvania smartweed (*Polygonum pennsylvanicum*), and jewelweed (*Impatiens capensis*). Characteristics of Wetlands A-MM are described in Appendix 3. Wetland determination Data Forms representative of on-site jurisdictional areas as well as non-jurisdictional upland areas have been included in Appendix 3.

Two small farm inline ponds are also present within the project area. Pond 1 (0.20 acres) is located at the top of UT1C and Pond 2 (0.79 acres) is located along UT2 below the confluence of UT2B. Both ponds will be removed in order to restore channel through these areas. Jurisdictional waters of the U.S. were surveyed by Kee Mapping and Survey, Professional Land Surveyors. A site walk was conducted with personnel from the USACE and NCDWR on March 10, 2015 to review jurisdiction waters. The USACE issued a jurisdictional verification on June 10, 2015 (SAW-2015-01209), included in Appendix 3.

Impacts to existing wetlands areas were avoided and minimized as much as possible during the design phase. Particular efforts were made to align proposed restoration stream sections to avoid existing wetlands as much as possible and minimize grading impacts. Approximately 0.30 acres of wetlands will be permanently impacted by project construction including cut and fill necessary for stream and floodplain grading. This represents impacts to approximately 14% of the site's wetlands. The majority of impacts (approximately 0.26 acres) occur in Wetlands Q, V, and MM which are heavily impacted by cattle grazing. Approximately 0.01 acres of Wetland Q and 0.02 acres of Wetland V are located within the proposed stream banks and will be converted from wetland to stream. Proposed floodplain grading will impact 0.04 acres of Wetland Q, 0.11 acres of Wetland V, and 0.08 acres of Wetland MM. During construction, wetland areas inside the limits of disturbance will be flagged with safety fence to prevent unintended impacts. This will be denoted in the final construction plans Erosion and Sediment Control sheets, details, and specifications. Remaining wetlands will be planted and protected by the conservation easement. This will all be described in the Pre-Construction Notification and depicted in the final Construction Plans.



5.2 Endangered and Threatened Species

5.2.1 Site Evaluation Methodology

The Endangered Species Act (ESA) of 1973, amended (16 U.S.C. 1531 et seq.), defines protection for species with the Federal Classification of Threatened (T) or Endangered (E). An “Endangered Species” is defined as “any species which is in danger of extinction throughout all or a significant portion of its range” and a “Threatened Species” is defined as “any species which is likely to become an Endangered Species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532).

Wildlands utilized the U.S. Fish and Wildlife Service (USFWS) and North Carolina Natural Heritage Program (NHP) databases in order to identify federally listed Threatened and Endangered plant and animal species for Guilford County, NC (USFWS, 2008 and NHP, 2009). Small whorled pogonia (*Isotria medeoloides*), listed as Threatened, is the only Endangered or Threatened Species in Guilford County. The bald eagle (*Haliaeetus leucocephalus*) is federally protected by the Bald and Golden Eagle Protection Act (BGPA).

Table 9. Federally Protected Species in Guilford County, NC - Candy Creek Mitigation Site

Species	Federal Status	Habitat
Vascular Plant		
Small whorled pogonia (<i>Isotria medeoloides</i>)	T	Montane oak-hickory or acidic cove forests
Vertebrate		
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	BGPA	Near large open waterbodies (i.e. rivers, lakes, marshes, seacoasts, and estuaries).

E = Endangered; T = Threatened; BGPA = Bald Eagle Protection Act

5.2.2 Threatened and Endangered Species Descriptions

5.2.2.1 Small Whorled Pogonia

The small whorled pogonia is a small perennial herb, approximately 9 to 25 cm in height with a whorl of green elliptical leaves. This species is typically found in montane oak-hickory or acidic cove forests. The understory structure of these habitats can range from dense rhododendron thickets to open/sparse shrub strata. Current threats to this species include loss of habitat and overutilization for scientific and private collections.

5.2.2.2 Bald Eagle

The bald eagle is a very large raptor species, typically 28 to 38 inches in length. Adult individuals are brown in color with a very distinctive white head and tail. Bald eagles typically live near large bodies of open water with suitable fish habitat including: lakes, marshes, seacoasts, and rivers. This species generally requires tall, mature tree species for nesting and roosting. Bald eagles were de-listed from the Endangered Species List in June 2007; however, this species remains under the protection of the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGPA). This species is known to occur in every U.S. state except Hawaii.



5.2.3 Biological Conclusion

A pedestrian survey conducted on September 26, 2013, indicated the site has no potential habitat for bald eagle. Potential habitat for small whorled pogonia was present within forested portions of the Site where cattle access is restricted but no individual plants were observed.

Review and comment from the USFWS was requested on February 27, 2014, in respect to the Candy Creek Mitigation Site and its potential impacts on threatened or endangered species. USFWS responded on April 4, 2014, and stated “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.” Review and comment was also requested concurrently from the North Carolina Wildlife Resource Commission regarding any possible issues that might emerge with respect to fish and wildlife issues associated with the project. The NCWRC responded on March 14, 2014, stating they did not anticipate the project to result in significant adverse impacts to aquatic and terrestrial wildlife resource. All correspondence is included in Appendix 7.

5.3 Cultural Resources

5.3.1 Site Evaluation Methodology

The National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470), defines the policy of historic preservation to protect, restore, and reuse districts, sites, structures, and objects significant in American history, architecture, and culture. Section 106 of the NHPA mandates that federal agencies take into account the effect of an undertaking on any property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

5.3.2 SHPO/THPO Concurrence

A letter was sent to the North Carolina State Historic Preservation Office (SHPO) on February 27, 2014, requesting review and comment on cultural resources potentially affected by the project. SHPO responded on March 24, 2014, and stated they were aware of no historic resources that would be affected by the project. All correspondence with SHPO is included in Appendix 7.

5.4 FEMA Floodplain Compliance and Hydrologic Trespass

Candy Creek is not within a Special Flood Hazard Area (SFHA). The nearest mapped FEMA floodplain is approximately 500 LF downstream of the project limits (Figure 7).

The only area with potential for off-site backwater is at the project headwaters of UT4. As a result of raising stream bed elevations to reconnect the reach with the project floodplain, the new stream bed will tie into an existing bedrock knickpoint. The proposed stream elevation has been designed lower than the top elevation of the bedrock knickpoint.

6.0 Reference Sites

6.1 Reference Streams

Eight reference reaches were used to support the design of the project reaches (Figure 8). Reference reaches can be used as a basis for design or, more appropriately, as one source of information on which to base a stream restoration design. Most, if not all, reference reaches identified in the North Carolina Piedmont are in heavily wooded areas and the mature vegetation contributes greatly to their stability. Design parameters for this project were also developed based on the design discharge along with dimensionless ratio values associated with successful restoration designs of streams in the North Carolina

Piedmont. Reference reach data for similar streams were obtained from existing data sets and used to verify design parameters. These reference streams were chosen because of similarities to the project streams including drainage area, valley slope and morphology, and bed material. Reference reaches were selected in two categories based on stream size, drainage area and valley slope appropriate to describe Candy Creek and its tributaries. Collins Creek, Long Branch, UT to Rocky Creek, and Spencer Creek Reach 2 have drainage areas ranging from 0.96 to 1.68 square miles and most with channel slopes less than 1%, similar to Candy Creek reaches 1 through 4. UT to Varnals Creek, Spencer Creek Reach 3, Agony Acres on-site reference reach UT1 – Reach 3, and UT to Richland Creek have drainage areas ranging from 0.028 to 0.41 square miles and most with channel slopes greater than 1%, similar to tributaries UT1C, UT1D, UT2, UT3, UT4, and UT5.

Collins Creek is located in the southern portion of Orange County near the confluence of the stream with the Haw River in Chatham County, according to the Little Troublesome Creek Restoration Plan (KCI Technologies, 2007). The drainage area is 1.68 square miles and the land use within the drainage area is low-density residential and forest. The Collins Creek reference site was classified as an E4 channel type according to the Rosgen classification system (Rosgen, 1994). The channel has a width to depth ratio ranging from 4.4 to 12.1 and an entrenchment ratio of 2 to 3. The channel has a bank height ratio of 1 to 1.1 indicating vertical stability. However, no planform feature information is available for the site.

The UT to Rocky Creek reference site is located in central Montgomery County within the Uwharrie National Forest. The drainage area is 1.10 square miles and the land use within the drainage area is a semi-mature forest. The UT to Rocky Creek reference site was classified as an E4b stream type with a low sinuosity (1.1). The channel has a width to depth ratio of 9.1 and an entrenchment ratio of 6. The reach has a valley slope of 2.6% and a channel slope of 2.4%. The bed material d50 for the reach is 22.6 mm indicating a gravel bed channel. Due to the low sinuosity, no pattern data were collected.

Long Branch is located in the central portion of Orange County northwest of Chapel Hill. According to the Collins Creek Restoration Plan (KCI Technologies, 2007), the drainage area is 1.49 square miles and the land use within the drainage area is low-density residential, agricultural lands, and forest. The Long Branch reference site was classified as a C4 channel type according to the KCI report. The channel has a width to depth ratio ranging from 8.8 to 13.8 and an entrenchment ratio of >2.5. The reach has a valley slope of 0.6% while the channel slope is 0.4%. The bed material D50 for the reach is 7.6 mm. WEI visited the reference site to verify the data presented in the KCI report. Two riffles were surveyed during the site visit. These riffles had width to depth ratios of 9.4 and 7.9 and entrenchment ratios of 11.7 and 12.1. Some cross sections are more typical of E stream types while others would classify as a C stream type. This is true of both the sections documented in the KCI report and those surveyed by Wildlands.

Spencer Creek Reach 2 is located in western Montgomery County near the crossroads of Ophir, NC, less than two miles from the Spencer Creek reference site (Buck Engineering, 2004). This site was classified as an E4 stream type and has a drainage area of 0.96 square miles. This reach flows through a mature forest and has a valley slope of 1.1% and a channel slope of 0.47%. The morphological parameters reported for the riffle cross section include a width to depth ratio from 5.8 to 7.1 and an entrenchment ratio of 5.5 and 10.2.

The UT to Varnals reference reach is located in south central Alamance County, NC near the Cane Creek Mountains. The site was identified by EcoLogic Associates and used as a reference reach for the Reedy Branch stream restoration site (EcoLogic Associates, 2002). Wildlands visited UT to Varnals in September 2014 and visually confirmed that the land use is unchanged from reported conditions and that the stream is laterally and vertically stable. Wildlands conducted a detailed morphological survey in October 2014. UT to Varnals has a drainage area of 0.41 square miles and is classified as a Rosgen E4 stream type for the

majority of the reach. UT to Varnals has a similar channel and valley slope to the tributaries of Candy Creek.

The Spencer Creek Reach 3 site is just downstream of Reach 2. Wildlands surveyed this reach in 2013. The width to depth ratio ranges from 7.9 to 9.3, the entrenchment ratio ranges from 1.7 to 4.3, the channel slope ranges from 1.9% to 2.2%, and the d50 is 11 mm. Pattern data are included for each of the three datasets for Spencer Creek. Given the similarities in drainage area, stream type, stream and valley slope, Spencer Creek Reach 3 serves as a reference reach for the tributaries of Candy Creek.

The Agony Acres reference reach (UT1 – Reach 3) is located in northeast Guildford County, NC. It was identified as a high quality preservation component of the nearby Agony Acres Mitigation Site in the mitigation plan submitted in March 2014 and was used as a reference reach for that project. It was selected as a reference reach due to its similarity in slope and drainage area to the tributaries on the project. A detailed survey was conducted in March of 2013. UT1 – Reach 3 has a drainage area of 0.3 square miles and classified as an E4 stream type.

UT to Richland Creek is located approximately 10 miles west of Carthage, NC in north-central Moore County. The stream was originally identified as a reference site for the Collins Creek Restoration plan by KCI Technologies (2007). Two reference reaches on the stream were surveyed by Wildlands in January 2012. UT to Richland Creek Reach 1 was selected as a reference reach for this project. It has a drainage area of 0.28 square miles and the land use within the drainage area is approximately 10-year-old timber regrowth. The reach was classified as a C4/E4 stream type with a low sinuosity. Reach 1 includes a stable riffle/run sequence that was used as a discharge reference.

Geomorphic conditions and dimensionless ratios for all the reference sites are summarized below in Tables 10a and 10b.

Table 10a. Summary of Reference Reach Geomorphic Parameters - Candy Creek Mitigation Site

Parameter	Notation	Units	Collins Creek		Long Branch		UT to Rocky Creek		Spencer Creek 2	
			min	max	min	max	min	max	min	max
stream type			E4		C/E4		E4b		E4	
drainage area	DA	sq mi	1.68		1.49		1.1		0.96	
bankfull discharge	Q_{bkf}	cfs	115-150		101	124	85		97	
bankfull cross-sectional area	A_{bkf}	SF	32.9		25	34.6	16.3		17.8	19.7
average velocity during bankfull event	v_{bkf}	fps	3.9		3.6	4	5.5		4.9	5.4
Cross-Section										
width at bankfull	w_{bkf}	feet	11.9-20.1		14.8	18.6	12.2		10.7	11.2
maximum depth at bankfull	d_{max}	feet	3.3-4.2		1.9	2.9	1.8		2.1	2.6
mean depth at bankfull	d_{bkf}	feet	1.6-2.7		1.3	2.1	1.3		1.6	1.8
bankfull width to depth ratio	w_{bkf}/d_{bkf}		4.4-12.1		7.9	13.8	9.1		5.8	7.1

Parameter	Notation	Units	Collins Creek		Long Branch		UT to Rocky Creek		Spencer Creek 2	
			min	max	min	max	min	max	min	max
depth ratio	d_{max}/d_{bkf}		1.5-2.5		1.4	1.5	1.3		1.3	1.4
bank height ratio	BHR		1-1.1		1.2	1.5	1.0		1.0	
floodprone area width	w_{fpa}	feet	60		>50		72		60	>114
entrenchment ratio	ER		2.0-3.0		>3.4		6		5.5	>10.2
Slope										
valley slope	S_{valley}	ft/ft	---		0.006		0.0261		0.0109	
channel slope	$S_{channel}$	ft/ft	0.003		0.004		0.0235		0.0047	
Profile										
riffle slope	S_{riffle}	ft/ft	0.003	0.008	0.013	0.012	0.0606	0.0892	0.013	
riffle slope ratio	$S_{riffle}/S_{channel}$		---		3.3	3.0	2.6	3.8	2.8	
pool slope	S_{pool}	ft/ft	0		0.0003	0.003	0	0.0037	0.0007	0.0009
pool slope ratio	$S_{pool}/S_{channel}$		0		0.1	0.8	0	0.16	0.15	0.19
pool-to-pool spacing	L_{p-p}	feet	32	80	50	105	26	81	71	
pool spacing ratio	L_{p-p}/w_{bkf}		1.6	6.7	3.4	7.1	2.2	6.7	6.3	6.6
pool cross-sectional area at bankfull	A_{pool}	SF	57.9		25.5	33.4	19.3		24.5	
pool area ratio	A_{pool}/A_{bkf}		---		1	1.3	1.2		1.2	1.4
maximum pool depth at bankfull	d_{pool}	feet	2.4		2.2		2.2		3.3	
pool depth ratio	d_{pool}/d_{bkf}		---		0.8	1.2	1.6		1.8	2.0
pool width at bankfull	w_{pool}	feet	24.3		16.2	18.8	10.9		17.5	
pool width ratio	w_{pool}/w_{bkf}		---		0.9	1.3	0.9		1.6	
Pattern										
sinuosity	K		---		1.3		1.1		2.3	
belt width	w_{bit}	feet	---		60		---		38	41
meander width ratio	w_{bit}/w_{bkf}		---		3.2	4.1	---		3.4	3.6
linear wavelength (formerly meander length)	L_m	feet	---		66	191	---		46	48
linear wavelength ratio (formerly meander length ratio)	L_m/w_{bkf}		---		4.5	10.3	---		4.1	4.4
meander length	L_m	feet	---		---	---	---		--	--
meander length ratio	L_m/w_{bkf}		---		---	---	---		--	--
radius of curvature	R_c	feet	---		16	87	---		11	15

Parameter	Notation	Units	Collins Creek		Long Branch		UT to Rocky Creek		Spencer Creek 2	
			min	max	min	max	min	max	min	max
radius of curvature ratio	R_c / w_{bkf}		---		1.1	4.7	---		1.3	1.4
Sediment										
d ₅₀ Description									Medium Gravel	
Reach Wide	d ₁₆	mm							<0.063	
	d ₃₅	mm							3	
	d ₅₀	mm							8.8	
	d ₈₄	mm							42	
	d ₉₅	mm							90	
	d ₁₀₀	mm								

Table 10b. Summary of Reference Reach Geomorphic Parameters - Candy Creek Mitigation Site

Parameter	Notation	Units	UT to Varnals Creek		Spencer Creek 3		Agony On-site Reference Reach - UT1 - Reach 3		UT to Richland Creek	
			Min	Max	min	max	min	max	min	Max
stream type			B		E4		E4		C4/E4	
drainage area	DA	sq mi	0.41		0.37		0.30		0.28	
bankfull discharge	Q_{bkf}	cfs	54.0		35		25		29.1	32
bankfull cross-sectional area	A_{bkf}	SF	10.3	12.3	6.6	8.7	10.7	11.3	7.8	8.5
average velocity during bankfull event	v_{bkf}	fps	4.4	5.2	5	5.6	2.2	2.4	3.5	4.1
Cross-Section										
width at bankfull	w_{bkf}	feet	9.3	10.5	6.3	9.3	9.1	10.4	8.8	10.4
maximum depth at bankfull	d_{max}	feet	1.5	1.7	1	1.2	1.8		1.1	1.3
mean depth at bankfull	d_{bkf}	feet	1.1	1.2	0.8	1.0	1.0	1.2	0.8	0.9
bankfull width to depth ratio	w_{bkf}/d_{bkf}		8.1	9.3	7.9	9.3	7.3	10.1	10	12.8
depth ratio	d_{max}/d_{bkf}		1.4	1.4	1.2	1.3	1.8		1.4	1.4
bank height ratio	BHR		0.9	1.0	1.0	1.0	1.0		1.4	2.1
floodprone area width	w_{fpa}	feet	20	64	14	125	>36		27.6	31.4
entrenchment ratio	ER		1.9	6.1	1.7	4.3	>3.9		2.5	4
Slope										

Parameter	Notation	Units	UT to Varnals Creek		Spencer Creek 3		Agony On-site Reference Reach - UT1 - Reach 3		UT to Richland Creek	
			Min	Max	min	max	min	max	min	Max
valley slope	S_{valley}	ft/ft	0.0200		0.022	0.031	0.010	0.034	-	
channel slope	$S_{channel}$	ft/ft	0.0170		0.019	0.022	0.0039	0.028	0.0131	
Profile										
riffle slope	S_{riffle}	ft/ft	0.024	0.057	0.0184	0.0343	N/A	N/A	0.021	0.045
riffle slope ratio	$S_{riffle}/S_{channel}$		4.2	10.0	1	1.6	N/A	N/A	1.18	3.43
pool slope	S_{pool}	ft/ft	0.000	0.015	0.0007	0.014	N/A	N/A	NA	
pool slope ratio	$S_{pool}/S_{channel}$		0.00	2.63	0	0.6	N/A	N/A	NA	
pool-to-pool spacing	L_{p-p}	feet	8	82	9	46	N/A	N/A	NA	
pool spacing ratio	L_{p-p}/W_{bkf}		0.5	5.6	1.4	4.9	N/A	N/A	NA	
pool cross-sectional area at bankfull	A_{pool}	SF	22.0	22.7	6.5	9.8	14.5		NA	
pool area ratio	A_{pool}/A_{bkf}		1.8	1.9	1	1.1	1.3		NA	
maximum pool depth at bankfull	d_{pool}	feet	2.5	2.6	1.2	1.8	2.5		NA	
pool depth ratio	d_{pool}/d_{bkf}		3.0	3.1	1.5	1.8	2.3		NA	
pool width at bankfull	W_{pool}	feet	15.1	18.6	6	12	9.4		NA	
pool width ratio	W_{pool}/W_{bkf}		1.0	1.3	1.0	1.3	1.0		NA	
Pattern										
sinuosity	K		1.20		1.0	1.3	1.35		1	
belt width	W_{blt}	feet	15	45	10	50	21	93	NA	
meander width ratio	W_{blt}/W_{bkf}		1.0	3.0	1.6	5.4	2.3	8.9	NA	
linear wavelength (formerly meander length)	L_m	feet	16	47	55	142	121	171	NA	
linear wavelength ratio (formerly meander length ratio)	L_m/W_{bkf}		1.1	3.2	8.7	15.3	13.3	16.4	NA	
meander length	L_m	feet	--	--	53	178	--	--	NA	
meander length ratio	L_m/W_{bkf}		--	--	8.4	19.1	--	--	NA	
radius of curvature	R_c	feet	8	47	12	85	14	60	NA	
radius of curvature ratio	R_c/W_{bkf}		0.6	3.2	1.9	9.1	1.5	5.8	NA	
Sediment										
d ₅₀ Description					Medium Gravel					
Reach Wide	d ₁₆	mm			1.866					
	d ₃₅	mm			8.85					
	d ₅₀	mm			11					

Parameter	Notation	Units	UT to Varnals Creek		Spencer Creek 3		Agony On-site Reference Reach - UT1 - Reach 3		UT to Richland Creek	
			Min	Max	min	max	min	max	min	Max
	d ₈₄	mm			64					
	d ₉₅	mm			128					
	d ₁₀₀	mm								

7.0 Determination of Credits

7.1 Stream Mitigation Credits

Mitigation credits presented in Table 11 are projections based upon site design. The Site is submitted for mitigation credit in the Cape Fear 03030002 service area. Upon completion of Site construction, the project components and credits data will be revised to be consistent with the as-built condition. This Site contains one external easement crossing (easement break) and nine internal easement crossings. The affected length of stream within the crossings are excluded from the restored footage and proposed SMU values in Table 11.

Table 11. Determination of Credits - Candy Creek Mitigation Site

Mitigation Credits									
	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorus Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	15,002	532	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Project Components						
Project Component or Reach ID	Proposed Stationing/Location	Approach (P1, P2, etc.)	Restoration or Restoration Equivalent	Restoration Footage* (LF)	Mitigation Ratio	Proposed Credit (SMU)
Candy Creek Reach 1	100+00 – 126+30	P1	Restoration	2,604	1:1	2,604
Candy Creek Reach 2	126+30 – 148+42	P1	Restoration	2,126	1:1	2,126
Candy Creek Reach 3	149+05 – 158+50	EI	Enhancement	600	1.5:1	400
Candy Creek Reach 3	158+50 – 170+67	EII	Enhancement	1,508	2.5:1	603
Candy Creek Reach 4	170+67 – 206+29	P1	Restoration	3,511	1:1	3,511
UT1C Reach 1	200+15 – 207+37	P1	Restoration	722	1:1	722
UT1C Reach 2	207+37 – 211+45		Preservation	408	5:1	82
UT1D	250+00 – 253+85	P1	Restoration	385	1:1	385

Project Components						
Project Component or Reach ID	Proposed Stationing/Location	Approach (P1, P2, etc.)	Restoration or Restoration Equivalent	Restoration Footage* (LF)	Mitigation Ratio	Proposed Credit (SMU)
UT2 Reach 1	300+00 – 304+45	EI	Enhancement	445	1.5:1	297
UT2 Reach 1	304+45 – 312+08	P1	Restoration	738	1:1	738
UT2 Reach 2	312+08 – 318+53	EI	Enhancement	645	1.5:1	430
UT2A	350+84 – 354+33	EI	Enhancement	349	1.5:1	233
UT2B	270+34 – 276+91	EII	Enhancement	657	2.5:1	263
UT3 Reach 1	400+00 – 411+50		Preservation	1,150	5:1	230
UT3 Reach 2	411+50 – 414+96	P1	Restoration	346	1:1	346
UT4	500+48 – 514+05	P1	Restoration	1,357	1:1	1,357
UT5 Reach 1	599+22 – 600+00		Preservation	78	5:1	16
UT5 Reach 2	600+00 – 610+12	P1	Restoration	987	1:1	987
UT5A	650+00 – 660+56		Preservation	1,020	5:1	204

*The Site contains one external easement crossing (easement break) and nine internal easement crossings. This value excludes the affected length of proposed stream centerline within each crossing.

Component Summation					
Restoration Level	Stream (linear feet)	Riparian Wetland (acres)	Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
Restoration	12,776	N/A	N/A	N/A	N/A
Enhancement I	2,039	N/A	N/A	N/A	N/A
Enhancement II	2,165	N/A	N/A	N/A	N/A
Preservation	2,656	N/A	N/A	N/A	N/A
Wetland Creation	N/A	N/A	N/A	N/A	N/A
Wetland Rehabilitation	N/A	N/A	N/A	N/A	N/A
Wetland Re-Establishment	N/A	N/A	N/A	N/A	N/A
Wetland Preservation	N/A	N/A	N/A	N/A	N/A
Wetland High Quality Preservation	N/A	N/A	N/A	N/A	N/A

8.0 Credit Release Schedule

All credit releases will be based on the total credits generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary DA authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the Site fails to meet the specified performance standard. The release of project credits will be subject to the criteria described as follows:

Table 12. Credit Release Schedule – Stream Credits - Candy Creek Mitigation Site

Monitoring Year	Credit Release Activity	Interim Release	Total Released
0	Initial Allocation – see requirements below	30%	30%
1	First year monitoring report demonstrates performance standards are being met	10%	40%
2	Second year monitoring report demonstrates performance standards are being met	10%	50% (60%)
3	Third year monitoring report demonstrates performance standards are being met	10%	60% (70%)
4	Fourth year monitoring report demonstrates performance standards are being met	5%	65% (75%)
5	Fifth year monitoring report demonstrates performance standards are being met	10%	75% (85%)
6	Sixth year monitoring report demonstrates performance standards are being met	5%	80% (90%)
7	Seventh year monitoring report demonstrates performance standards are being met and project has received closeout approval	10%	90% (100%)

8.1 Initial Allocation of Released Credits

The initial allocation of released credits, as specified in the mitigation plan can be released by DMS without prior written approval of the DE upon satisfactory completion of the following activities:

- a. Approval of the final Mitigation Plan.
- b. Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property.
- c. Completion of project construction (the initial physical and biological improvements to the mitigation site) pursuant to the mitigation plan; per the DMS Instrument, construction means that a mitigation site has been constructed in its entirety, to include planting, and an as-built report has been produced. As-built reports must be sealed by an engineer prior to project closeout, if appropriate but not prior to the initial allocation of released credits.
- d. Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required.

8.2 Subsequent Credit Releases

All subsequent credit releases must be approved by the DE, in consultation with the IRT, based on a determination that required performance standards have been achieved. For stream projects a reserve of 10% of a site's total stream credits shall be released after two bankfull events have occurred, in separate years, provided the channel is stable and all other performance standards are met. In the event that less than two bankfull events occur during the monitoring period, release of these reserve credits shall be at the discretion of the IRT. As projects approach milestones associated with credit release, the DMS will submit a request for credit release to the DE along with documentation substantiating achievement of criteria required for release to occur. This documentation will be included with the annual monitoring report.

9.0 Project Site Mitigation Plan

9.1 Justification for Proposed Intervention

As detailed in Section 1.0, the principal goals and objectives focus on improving the ecological health of the Site, including a reduction in sedimentation and nutrient concentrations. The existing conditions assessment shows that the majority of the streams are deeply incised with actively eroding banks. The mass bank wasting from on-site streams has inundated the channels with sediment, which has degraded the bedform and in-stream habitat. Further adverse impacts are due to cattle access and lack of riparian buffer in the pastures, as well as channel alteration, including impoundments. These problems need to be resolved by a combination of stream restoration and enhancement, which will reestablish stream function and riparian ecosystems. Preservation along stable stream reaches will provide additional protection.

Restoration is proposed for Candy Creek Reach 1A – 1C, Candy Creek Reach 2A – 2B, Candy Creek Reach 4A – 4B, UT1C, UT1D, UT2 Reach 1, UT3 Reach 2, UT4, and UT5 Reach 2. Enhancement I is proposed for Candy Creek Reach 3, UT2 Reach 1, UT2 Reach 2, and UT2A. Enhancement II is proposed for Candy Creek Reach 3 and UT2B. Preservation is proposed for UT1C, UT3 Reach 1, UT5 Reach 1, and UT5A.

Enhancement is proposed on reaches that have established at least one functional stream feature, such as bedform diversity, stable banks, or low bank height. Restoration is not proposed for these reaches in order to preserve the functional feature while avoiding large scale tree loss.

9.2 Design Discharge Development

Several methods were used to develop bankfull discharge estimates of the project reaches. The resulting values were compared and best professional judgment was used to determine the specific design discharge for each project reach.

The methods to estimate discharge included:

1. Wildlands' in-house flood frequency analysis of smaller size rural watersheds in the North Carolina Piedmont, based on published USGS data and reports;
2. The published North Carolina rural Piedmont drainage area – discharge relationships (Harman, et al., 1999) shown on Figure 9;
3. The recently completed provisional North Carolina rural Piedmont/ Mountain drainage area-discharge relationships (Walker, unpublished) also shown on Figure 9;
4. Discharge estimates of existing channels at top of bank to estimate an upper limit discharge;
5. Regional flood frequency analysis developed for this project;
6. Drainage area-discharge relationships developed from reference reaches selected for this project;
7. Site specific observations.

9.2.1 Wildlands' In-House Flood Frequency Analysis

Wildlands produced a set of discharge regression equations using 28 published USGS gage station records for drainage basins entirely within Region 1 (Piedmont). Of the 28 gages, 23 are published in the report *Magnitude and Frequency of Rural Floods in the Southeastern United States* (Weaver, et al., 2009) and 5 additional gages, all with drainage areas <1 square mile, have been added to supplement the dataset. The analyzed gages have drainage areas from 0.25 to 9.62 square miles, have at least 10 years of peak streamflow data records, and have a maximum percent impervious less than 10%. Gages were statistically analyzed by Wildlands to support the in-house regression equations developed. The in-house equations provide estimates of peak discharge for floods with a recurrence interval of 1, 1.2, 1.5, 1.8, and 2 years.

9.2.2 NC Rural Piedmont Regional Curve Predictions

The published NC rural Piedmont curve was used to estimate discharge based on drainage area using regional relationships (Harman, et al., 1999). Figure 9 illustrates the NC Piedmont curve along with other data used for these analyses.

9.2.3 Provisional Updated NC Piedmont/Mountain Regional Curve Predictions

The draft updated curve for rural Piedmont and mountain stream channels was used to estimate discharge based on drainage area using regional relationships (Walker, unpublished). Experience indicates that the original NC Curves often over-predict bankfull discharge for smaller stream systems. The original rural curve was developed using both gaged and ungaged sites. The methods used to develop discharge estimations for the ungaged sites are believed to have over-estimated the points on the discharge curve (Walker, 2013). In addition, some of the gaged sites used in the original rural curve may have been somewhat incised, with bank height ratios up to 1.5. This enlargement may have contributed to larger discharge values used in development of the curve (Harman, 2013). The updated curves appear to be a better predictor of bankfull parameters for many streams, although data points are limited for drainage areas less than 3 square miles. This updated curve is also plotted on Figure 9.

9.2.4 Discharge Analysis of Existing Channel Top of Bank

Manning's equation was used to calculate the discharge in each of the project reaches for the channel-filling flow at existing tops of the banks. These values provide an upper limit on the possible range of design discharges but are likely larger than bankfull flow.

9.2.5 Regional Flood Frequency Analysis

Five USGS stream gage sites were identified within reasonable proximity of the project site for use in development of a project specific regional flood frequency analysis. Data from these gages were used to develop a regional flood frequency curve as described by Dalrymple (1960). The gages used were:

- 0209331325 – Candy Creek at SR2700 near Monticello, NC (drainage area 1.1 square miles);
- 02094775 – Ryan Creek below US220 at Greensboro, NC (drainage area 4.12 square miles);
- 0210166029 – Rocky River at SR1300 near Crutchfield Crossroads, NC (drainage area 7.42 square miles);
- 02099000 – East Fork Deep River near High Point, NC (drainage area 14.8 square miles); and
- 02094000 – Horsepen Creek at Battle Ground, NC (drainage area 15.9 square miles).

The five gages passed the homogeneity test. However, each of these gages, with the exception of Candy Creek, represents a larger drainage area than the project reaches. The ranges of discharge for 1.2, 1.5, and 1.8-year events were similar in magnitude to values developed from other various sources. As a result,

the discharge data obtained from the regional flood frequency analysis for these three recurrence interval events were considered and incorporated in design discharge determination.

9.2.6 Drainage Area- Discharge Relationships from Reference Reaches

Reference reaches for this project included eight sites utilized for discharge reference data. Two sets of reference reaches were collected to span the range of drainage areas and slopes for the project reaches. In the first set, the four larger streams served to provide discharge references for Candy Creek Reaches 1 through 4. These include Collins Creek with a drainage area of 1.68 square miles, Long Branch with a drainage area of 1.49 square miles, UT to Rocky Creek with a drainage area of 1.1 square miles, and Spencer Creek 2 with a drainage area of 0.96 square miles. In the second set, the four smaller streams served to provide discharge references for the unnamed on-site tributaries. These include UT to Varnals Creek with a drainage area of 0.41 square miles, Spencer Creek 3 with a drainage area of 0.37 square miles, Agony Acres on-site reference reach – UT1A Reach 3 with a drainage area of 0.30 square miles, and UT to Richland Creek with a drainage area of 0.28 square miles. These data were used as a comparison to the bankfull discharge estimations derived from regional discharge relationships described above. Bankfull features were surveyed at each site and Manning’s equation was used to estimate a discharge corresponding to the bankfull stage of each. These estimates of bankfull discharge were plotted on Figure 9 for comparison to regional curves and other methods of estimating discharge. The reference reach discharge estimates plot close to the other data sets. More information about reference reaches and their geomorphology is provided in Section 6.0 of this report.

9.2.7 Design Discharge Selection

In consideration of each of these discharge estimates, low baseflow characteristics, size of contributing watersheds, desired restoration of a natural flooding regime, and experience designing stream networks, Wildlands selected the design discharge values in the lower range that can be supported by available data. Design values were selected most similar to the reference reach estimates and on the lower range of North Carolina Rural relationships. Tables 13a – 13c summarize the results of each of the discharge analyses described in this section and the final selected design discharge for each of the project reaches.

Table 13a. Design Discharge Analysis Summary - Candy Creek Mitigation Site

	Candy Creek Reach 1A	Candy Creek Reach 1B	Candy Creek Reach 1C	Candy Creek Reach 2A	Candy Creek Reach 2B	Candy Creek Reach 3	Candy Creek Reach 4	
DA (acres)	140	280	483	593	694	809	937	
DA (sq. mi.)	0.22	0.44	0.7	0.93	1.08	1.26	1.46	
	Q_{bkf} (cfs)	Q_{bkf} (cfs)	Q_{bkf} (cfs)					
USGS rural flood frequency extrapolations	1-yr event	7	13	20	24	27	31	35
	1.2-yr event	25	42	63	73	82	92	103
	1.5-yr event	37	61	90	104	117	131	145
	1.8-yr event	45	75	110	128	143	160	177
	2-yr event	50	82	120	139	156	174	193
Piedmont Regional Curve	Bankfull	30	49	73	84	94	105	117
Alan Walker Curve	Bankfull	17	29	45	52	59	67	75

		Candy Creek Reach 1A	Candy Creek Reach 1B	Candy Creek Reach 1C	Candy Creek Reach 2A	Candy Creek Reach 2B	Candy Creek Reach 3	Candy Creek Reach 4
	DA (acres)	140	280	483	593	694	809	937
	DA (sq. mi.)	0.22	0.44	0.7	0.93	1.08	1.26	1.46
Max Q at surveyed top of bank		666	407	438	331	511	475	320
Regional Flood Frequency Analysis (from Gage Homogeneity Test)	1.2-yr event	16	27	40	47	53	60	67
	1.5-yr event	23	38	57	67	76	85	95
	1.8-yr event	28	47	71	83	94	105	118
Q _{bkf} from Reference Reach Curve		25	42	65	77	87	98	110
Final Design Q		24	42	65	75	85	93	105

Table 13b. Design Discharge Analysis Summary - Candy Creek Mitigation Site

		UT1C	UT1D	UT2 Reach 1	UT2 Reach 2	UT2A
	DA (acres)	28	6.1	44	63	15
	DA (sq. mi.)	0.04	0.01	0.07	0.10	0.02
		Q _{bkf} (cfs)				
USGS rural flood frequency extrapolations	1-yr event	2	1	3	4	1
	1.2-yr event	8	3	11	14	5
	1.5-yr event	11	4	16	21	7
	1.8-yr event	14	5	20	26	9
	2-yr event	16	5	22	28	10
Piedmont Regional Curve	Bankfull	9	3	13	17	6
Alan Walker Curve	Bankfull	5	1	7	9	3
Max Q at surveyed top of bank		594	26	188	165	241
Regional Flood Frequency Analysis (from Gage Homogeneity Test)	1.2-yr event	5	1	7	9	3
	1.5-yr event	7	2	9	12	4
	1.8-yr event	8	3	12	15	5
Q _{bkf} from Reference Reach Curve		7	2	10	13	4
Final Design Q		6	2	9	12	4

Table 13c. Design Discharge Analysis Summary - Candy Creek Mitigation Site

		UT2B	UT3	UT4	UT5
	DA (acres)	24	79	190	137
	DA (sq. mi.)	0.04	0.12	0.30	0.21
		Q_{bkf} (cfs)	Q_{bkf} (cfs)	Q_{bkf} (cfs)	Q_{bkf} (cfs)
USGS rural flood frequency extrapolations	1-yr event	2	4	9	7
	1.2-yr event	7	17	32	25
	1.5-yr event	10	24	46	36
	1.8-yr event	13	30	56	45
	2-yr event	14	33	62	49
Piedmont Regional Curve	Bankfull	8	20	37	29
Alan Walker Curve	Bankfull	4	11	21	17
Max Q at surveyed top of bank		108	380	707	457
Regional Flood Frequency Analysis (from Gage Homogeneity Test)	1.2-yr event	4	10	20	16
	1.5-yr event	6	15	28	22
	1.8-yr event	7	18	35	28
Q_{bkf} from Reference Reach Curve		6	16	31	24
Final Design Q		6	14	30	22

9.3 Proposed Stream Design Summary

The design streams will be restored to an appropriate stream type based on the surrounding landscape, climate, and natural vegetation communities but also with strong consideration to existing watershed conditions and trajectory. The project includes a combination of stream restoration, enhancement, and preservation as shown on Figures 10a and 10b. The specific proposed stream restoration and enhancement measures are described below.

All stream restoration reaches included in the design for this project will be constructed as C/E or B type streams according to the Rosgen classification system (Rosgen, 1996), using the morphologic design parameters were selected based on designer experience and judgment and were supported by morphologic data from reference reach data sets. C/E streams are meandering streams with well-developed floodplains and average gradients of 2% or less. C/E streams occur within a wide range of valley types and are appropriate for Candy Creek Reaches 1 – 4, UT2 Reach 2, UT3, UT4, and UT5. B streams occur within headwater and 2nd order streams in steeper, more confined valley settings and have narrow floodplains with average gradients typically steeper than 2%. Construction of B-type step-pool channels are acceptable for UT1C, UT1D, UT2 Reach 1, and UT2A valleys.

The stream restoration construction will result in channels sized to convey the design discharge. Flows larger than the design discharge will flood the adjacent floodplain and wetlands. The reconstructed channel banks will be built with stable side slopes, constructed with native materials, matted, and seeded for stability. The sinuous plan form of the C/E channels will be built to mimic a natural Piedmont stream. The plan form of B channels will fit natural or reconstructed valleys.

Generally, deeper pools will occur in the outside of the meander bends and shallow riffles will dominate the straight sections of channel between meanders. Pools will provide energy dissipation and aquatic habitat. In-stream structures will be constructed of logs and brush and will include constructed riffles, log sills, log vanes, and log j-hooks. These structures will provide grade control and habitat improvements. Sills will be used at key grade control points, near confluences with adjoining tributaries and adjacent to old channel and proposed stream crossings.

One existing bridge crossing at Hopkins Road, excluded from the conservation easement, will remain at the breakpoint between Candy Creek Reaches 2 and 3. The bridge is being replaced by NCDOT. Existing bedrock grade control beneath the crossing will be utilized to control the transition between Candy Creek Reach 2 and 3. Nine internal crossings will be added to allow landowner access between parcels.

The start of Candy Creek Reach 1 is controlled by an existing culvert outfall at the upstream project limits. Candy Creek Reaches 1 and 2 will be restored with the Priority 1 approach, connecting the proposed top of bank at approximately the existing floodplain elevation. There are two exceptions where some floodplain excavation is necessary to connect with existing channel grade constraints. The upper 500 feet of Candy Creek Reach 1 will require approximately 6 to 18" of floodplain excavation to transition to a full Priority 1 approach approximately 500 feet downstream from the upstream project limits. Additionally, the lower 500 feet of Candy Creek Reach 2 will require approximately 12 to 30" of floodplain excavation to transition to existing bedrock grade control upstream of the bridge at Hopkins Road. A Priority 1 restoration approach continues for the length of Reaches 1 and 2, connecting with UT2, UT3, UT4, and UT5 before transitioning to the enhancement approach for Candy Creek Reach 3. The design profile slopes of Candy Creek Reaches 1 and 2 range from approximately 0.6% to 1.0%.

Table 14a. Design Morphological Parameters - Candy Creek Mitigation Site

	Notation	Units	Candy Creek Reach 1A		Candy Creek Reach 1B		Candy Creek Reach 1C		Candy Creek Reach 2A		Candy Creek Reach 2B	
			Min	Max								
stream type			C/E		C/E		C/E		C/E		C/E	
drainage area	DA	sq mi	0.22		0.44		0.88		0.93		1.08	
design discharge	Q	cfs	24		42		65		75		85	
bankfull cross-sectional area	A _{bkf}	SF	8.2		13.2		19.9		21.8		20.9	
average velocity during bankfull event	v _{bkf}	fps	3.0		3.3		3.2		3.5		4.0	
Cross-Section												
width at bankfull	w _{bkf}	feet	10.6		13.6		16.8		17.5		17.0	
maximum depth at bankfull	d _{max}	feet	1.2		1.5		1.8		1.9		1.9	
mean depth at bankfull	d _{bkf}	feet	0.8		1.0		1.2		1.2		1.2	
maximum depth ratio	d _{max} /d _{avg}		1.5		1.5		1.5		1.5		1.5	

	Notation	Units	Candy Creek Reach 1A		Candy Creek Reach 1B		Candy Creek Reach 1C		Candy Creek Reach 2A		Candy Creek Reach 2B	
			Min	Max								
bankfull width to depth ratio	W_{bkf}/d_{bkf}		13.7		14.0		14.2		14.0		13.8	
low bank height		feet	1.2		1.5		1.8		1.9		1.9	
bank height ratio	BHR		1.0		1.0		1.0		1.0		1.0	
floodprone area width	W_{fpa}	feet	23	53	30	68	37	84	39	88	37	85
entrenchment ratio	ER		2.2	5.0	2.2	5.0	2.2	5.0	2.2	5.0	2.2	5.0
Slope												
valley slope	S_{valley}	feet/foot	0.0124		0.0088		0.0046		0.0062		0.0180	
channel slope ¹	S_{chnl}	feet/foot	0.0043	0.0206	0.0061	0.0124	0.0061	0.0061	0.0037	0.0093	0.0093	0.0093
Profile												
riffle slope	S_{riffle}	feet/foot	0.005	0.078	0.007	0.047	0.007	0.023	0.004	0.035	0.011	0.035
riffle slope ratio	S_{riffle}/S_{chnl}		1.1	3.8	1.2	3.8	1.2	3.8	1.2	3.8	1.2	3.8
pool slope	S_p	feet/foot	0.000	0.063	0.000	0.019	0.000	0.009	0.000	0.005	0.000	0.014
pool slope ratio	S_p/S_{chnl}		0.00	0.80	0.00	0.40	0.00	0.40	0.00	0.82	0.00	0.40
pool-to-pool spacing	L_{p-p}	feet	23	85	30	106	37	118	39	124	37	119
pool spacing ratio	L_{p-p}/W_{bkf}		2.2	8.0	2.2	7.8	2.2	7.0	2.2	7.1	2.2	7.0
pool cross-sectional area		SF	8.2	15.8	13.2	25.1	19.9	39.4	21.8	42.9	20.9	39.7
pool area ratio			1.0	1.9	1.0	1.9	1.0	2.0	1.0	2.0	1.0	1.9
maximum pool depth		feet	0.9	2.4	1.2	3.0	1.4	3.7	1.5	3.9	1.5	3.8
pool depth ratio			1.2	3.1	1.2	3.1	1.2	3.1	1.2	3.1	1.2	3.1
pool width at bankfull		feet	11.7	17.0	15.0	21.8	18.5	26.9	19.3	28.0	18.7	27.2
pool width ratio			1.1	1.6	1.1	1.6	1.1	1.6	1.1	1.6	1.1	1.6
Pattern												
sinuosity	K		1.17		1.16		1.14		1.23		1.26	
belt width	W_{bit}	feet	28	94	39	121	50	150	48	156	38	151
meander width ratio	W_{bit}/W_{bkf}		2.6	8.9	2.9	8.9	3.0	8.9	2.2	8.9	2.2	8.9



	Notation	Units	Candy Creek Reach 1A		Candy Creek Reach 1B		Candy Creek Reach 1C		Candy Creek Reach 2A		Candy Creek Reach 2B	
			Min	Max								
linear wavelength ratio	LW		43	158	56	194	69	223	72	238	70	227
linear wavelength	LW/w_{bkf}		4.1	14.9	4.1	14.3	4.1	13.3	4.1	13.6	4.1	13.3
meander length	L_m	feet	53	148	68	190	84	235	88	245	85	238
meander length ratio	L_m/w_{bkf}		5.0	14.0	5.0	14.0	5.0	14.0	5.0	14.0	5.0	14.0
radius of curvature	R_c	feet	16	34	20	44	25	54	26	56	26	54
radius of curvature ratio	R_c/w_{bkf}		1.5	3.2	1.5	3.2	1.5	3.2	1.5	3.2	1.5	3.2

¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).

Candy Creek Reach 3 is proposed for Enhancement I between Hopkins Road and the confluence of UT1D, and Enhancement II through the remainder of the downstream corridor until Candy Creek Reach 4. Enhancement I activities will include minor realignment of channel pattern by straightening a few tight meander bends and excavating bankfull benches to improve the expansion of flow between Hopkins Road and the UT1D confluence. Channel profile will be adjusted with the installation of constructed riffles, j-hook vanes, and a cross vane. Enhancement II measures will include the sporadic placement of in-stream structures for bank protection, grade control, and to help raise the channel bed slightly to lessen incision throughout the reach. Bankfull benches will be created in selected areas where the channel dimension is constricted to afford a wider channel width and limited floodplain access. In multiple locations, short sections of manmade levy will be excavated to remove historic flood protection and re-connect bankfull flows to the wider floodplain.

Dimension, pattern, and profile will be restored in Candy Creek Reach 4 using a Priority 1 design approach. A new, offline, meandering channel will be constructed in the right floodplain, occasionally tying back into the existing channel in an effort to maximize belt width while avoiding impacts to existing wetlands and trees located throughout the reach corridor. Several vernal pools will be created along the left floodplain from unfilled portions of the remnant channel in order to create floodplain diversity and reduce site impacts that would be necessary to haul in extra fill material. The elevated channel bed from the Priority 1 approach will help raise the water table and increase the frequency of overbank flows, thereby helping to improve hydrologic connectivity between the channel and wetlands located in both floodplains. The reach transitions to a step-pool morphology within the downstream 731 LF of channel as the valley narrows and steepens, eventually stepping down to a Priority 2 channel to match the existing bed elevation at the downstream project limits.

Table 14b. Design Morphological Parameters – Candy Creek Mitigation Site



	Notation	Units	Candy Creek Reach 3		Candy Creek Reach 4A		Candy Creek Reach 4B	
			Min	Max	Min	Max	Min	Max
stream type			C/E		C/E		C/E	
drainage area	DA	sq mi	1.26		1.46		1.46	
design discharge	Q	cfs	93		105		105	
bankfull cross-sectional area	A _{bkf}	SF	28.0		32.1		27.2	
average velocity during bankfull event	v _{bkf}	fps	3.2		3.3		4.0	
Cross-Section								
width at bankfull	w _{bkf}	feet	20.0		22.0		20.0	
maximum depth at bankfull	d _{max}	feet	2.1		2.2		2.0	
mean depth at bankfull	d _{bkf}	feet	1.4		1.5		1.4	
maximum depth ratio	d _{max} /d _{avg}		1.5		1.5		1.5	
bankfull width to depth ratio	w _{bkf} /d _{bkf}		14.3		15.1		14.7	
low bank height		feet	2.1		2.2		2.0	
bank height ratio	BHR		1.0		1.0		1.0	
floodprone area width	w _{fpa}	feet	44	100	77	176	70	120
entrenchment ratio	ER		2.2	5.0	3.5	8.0	3.5	6.0
Slope								
valley slope	S _{valley}	feet/foot	0.0066		0.0047		0.0117	
channel slope ¹	S _{chnl}	feet/foot	0.004	0.005	0.004	0.008	0.009	0.013
Profile								
riffle slope	S _{riffle}	feet/foot	0.006	0.013	0.006	0.020	0.011	0.039
riffle slope ratio	S _{riffle} /S _{chnl}		1.5	2.5	1.5	2.5	1.2	3.0
pool slope	S _p	feet/foot	0.000	0.003	0.000	0.004	0.000	0.013
pool slope ratio	S _p /S _{chnl}		0.00	0.20	0.00	0.20	0.00	0.40

	Notation	Units	Candy Creek Reach 3		Candy Creek Reach 4A		Candy Creek Reach 4B	
			Min	Max	Min	Max	Min	Max
pool-to-pool spacing	L_{p-p}	feet	40	130	88	154	26	132
pool spacing ratio	L_{p-p}/w_{bkf}		2.0	6.5	4.0	7.0	1.3	6.6
pool cross-sectional area		SF	36.4	50.4	41.8	61.0	35.4	51.7
pool area ratio			1.3	1.8	1.3	1.9	1.3	1.9
maximum pool depth		feet	2.1	4.2	2.9	4.4	2.7	4.1
pool depth ratio			1.5	3.0	2.0	3.0	2.0	3.0
pool width at bankfull		feet	24.0	32.0	26.4	35.2	24.0	32.0
pool width ratio			1.2	1.6	1.2	1.6	1.2	1.6
Pattern								
sinuosity	K		1.23		1.30		1.32	
belt width	w_{blt}	feet	NA		66	154	30	100
meander width ratio	w_{blt}/w_{bkf}		NA		3.0	7.0	1.5	5.0
linear wavelength ratio	LW		NA		88	220	70	200
linear wavelength	LW/w_{bkf}		NA		4.0	10.0	3.5	10.0
meander length	L_m	feet	NA		84	220	80	220
meander length ratio	L_m/w_{bkf}		NA		3.8	10.0	4.0	11.0
radius of curvature	R_c	feet	NA		25	55	25	50
radius of curvature ratio	R_c/w_{bkf}		NA		1.2	2.5	1.3	2.5
¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).								

Restoration activities for UT1C will include draining the upstream pond and excavating a new and steeper valley through the pond bed, impoundment, and further downstream that supports more of a step-pool channel morphology and matches the natural valley. The existing channel is deeply eroded into the valley bottom and along portions of the valley wall, and is dissipating flows laterally through severely eroded meander bends that appear to be migrating down valley. The step-pool channel will be restored as a

Priority 1 B/C type stream according to the Rosgen classification system and will dissipate flows vertically through the narrow, wooded valley. The channel will be aligned in the low point of the valley downstream of the impoundment, similar to that of the existing channel alignment, but will be raised approximately three to four feet in elevation by placing fill, excavated from the dam embankment, in the existing channel. The design channel profile proposed through the drained pond bed will be consistent in slope with that of the elevated channel profile further downstream to help maintain hydrology through the transition of the newly created valley. The Priority 1 design approach for UT1C is proposed for approximately 740 LF from the upstream reach limits to just downstream of a breached, relic impoundment. The remaining 408 LF of existing channel located downstream of the relic impoundment exhibits a stable geometry and intact in-stream habitat, and is proposed for preservation.

Similar to UT1C, the proposed design approach for UT1D is Priority 1 stream restoration involving the restoration of the valley via excavation through the old pond bed and breached dam embankment. The proposed channel for UT1D will begin upstream as a low gradient, meandering, C type stream constructed through a portion of the old pond bed and existing valley for approximately 114 LF before transitioning to a B type step-pool channel for 220 LF until its confluence with Candy Reach 3. The gullied ephemeral channel draining to UT1D will be stabilized with the installation of a series of grade control drop structures to prevent subsequent headcutting and minimize downstream sediment loading. The steep, exposed banks surrounding the upstream origin of the reach will be sloped back and stabilized.

The bedform along UT2 Reach 1a is functioning, in spite of mass bank failure and deep incision. In order to retain the bedform, the proposed Enhancement 1 approach is to excavate a floodplain bench along both banks. This will allow floodplain access and stabilize the terrace slopes. Only a few structures and riffles will be installed to supplement bedform and habitat. The topsoil will be stockpiled during construction to be spread on cut areas due to the low quality of sub-soils.

Due to the cattle-impacted channel, combined with sparse tree cover, restoration is proposed for UT2 Reach 1B. Restoration will transition from a Priority 2 at the upstream end to Priority 1 as the stream approaches the existing cattle pond. Just after mobilization, the dam will be breached and the pond drained to facilitate drying of the silt. The landowner has agreed that the pond silt can be spread on a nearby low point on his property. Performing this first will allow for easier handling once excavation begins. Through the pond bed, restoration will resemble a Priority 2 approach, with wide floodplain benches and terrace slopes tying into natural ground. A permanent culvert crossing will be installed on this reach that will allow free access for cattle crossing. The internal crossing will be fence to exclude cattle from the easement.

UT2 Reach 2 will be raised to meet the proposed elevation of Candy Creek as part of an Enhancement 1 approach. The banks along UT2 Reach 2 are fairly stable for the most part and the channel has developed decent pattern. The raised channel will retain the existing pattern and a floodplain bench will be excavated to allow for floodplain access. In-stream log sills and constructed riffles will be used to raise the bed elevation through the reach. This will also allow for large, deep pools between structures, which will benefit habitat.

Enhancement 1 for UT2A will consist of excavating a floodplain bench along both banks, stabilizing the two existing headcuts, and adding riffles and pools for habitat. The excavated bench will address the channel incision and entrenchment while laying the terrace slopes back to a flatter, more stable slope. A log step pool series will be installed to arrest the migrating headcuts and achieve a more consistent channel slope. Habitat will be enhanced by introducing riffles and pools through log structures.

Since UT2B is only slightly incised for most of the reach, spot bank grading and several in-stream structures are proposed. An Enhancement 2 approach will retain the pattern of the existing channel while addressing

discrete occurrences of vertical or stressed banks and providing habitat through riffle and pool structures. Nearby trees, along with in-stream structures, will help to hold the existing sinuosity in place. One short section (approximately 50 LF) of channel will be realigned to repair a blowout caused by cattle access. The steeper intermittent upstream section will be stabilized using a log step pool system that spreads the drop out and dissipates energy in the pools.

Table 14c. Design Morphological Parameters – Candy Creek Mitigation Site

	Notation	Units	UT1C		UT1D		UT2 Reach 1		UT2 Reach 2		UT2A	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
stream type			B/C		B/C		B		C/E		B	
drainage area	DA	sq mi	0.04		0.01		0.07		0.10		0.02	
design discharge	Q	cfs	6		2		9		12		4	
bankfull cross-sectional area	A _{bkf}	SF	2.1		0.8		2.7		3.9		1.3	
average velocity during bankfull event	V _{bkf}	fps	2.5		3.0		3.1		3.1		2.3	
Cross-Section												
width at bankfull	w _{bkf}	feet	5.8		3.7		6.4		7.5		4.6	
maximum depth at bankfull	d _{max}	feet	0.5		0.3		0.6		0.8		0.4	
mean depth at bankfull	d _{bkf}	feet	0.4		0.2		0.4		0.5		0.3	
maximum depth ratio	d _{max} /d _{avg}		1.4		1.5		1.4		1.5		1.4	
bankfull width to depth ratio	w _{bkf} /d _{bkf}		16.0		16.1		15.1		14.4		16.3	
low bank height		feet	0.5		0.3		0.6		0.8		0.4	
bank height ratio	BHR		1.0		1.0		1.0		1.0		1.0	
floodprone area width	w _{fpa}	feet	13	29	8	18	19	82	16	28	10	18
entrenchment ratio	ER		2.2	5.0	2.2	5.0	3.0	12.8	2.1	3.7	2.2	3.9
Slope												
valley slope	S _{valley}	feet/foot	0.04		0.0523		0.0380		0.0190		0.0380	
channel slope ¹	S _{chnl}	feet/foot	0.0277		0.0056	0.0748	0.0095	0.0352	0.0141	0.0158	0.0317	0.0362
Profile												
riffle slope	S _{riffle}	feet/foot	0.030	0.050	0.006	0.112	0.011	0.070	0.017	0.032	0.035	0.065

	Notation	Units	UT1C		UT1D		UT2 Reach 1		UT2 Reach 2		UT2A	
			Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
riffle slope ratio	S_{riffle}/S_{chnl}		1.1	1.8	1	1.5	1.2	2	1.2	2	1.1	1.8
pool slope	S_p	feet/foot	0.000	0.001	0.000	0.001	0.000	0.028	0.000	0.013	0.000	0.026
pool slope ratio	S_p/S_{chnl}		0.00	0.20	0.00	0.01	0.00	0.40	0.00	0.40	0	0.40
pool-to-pool spacing	L_{p-p}	feet	8	29	5	26	8	42	17	53	6	30
pool spacing ratio	L_{p-p}/W_{bkf}		1.3	5.0	1.5	7.0	1.3	6.6	2.2	7.0	1.3	6.6
pool cross-sectional area		SF	2.5	4.2	1.0	1.7	3.0	5.4	3.9	7.4	1.4	2.6
pool area ratio			1.2	2.0	1.2	2.0	1.1	2.0	1.0	1.9	1.1	2.0
maximum pool depth		feet	0.7	1.3	0.5	0.8	1.0	1.9	1.0	2.0	0.6	1.0
pool depth ratio			2.0	3.5	2.0	3.5	2.3	4.4	2.0	3.9	2.0	3.5
pool width at bankfull		feet	6.4	8.7	4.0	5.5	6.4	9.6	8.3	12.0	4.6	6.9
pool width ratio			1.1	1.5	1.1	1.5	1.0	1.5	1.1	1.6	1.0	1.5
Pattern												
sinuosity	K		1.08		1.04		1.03		1.09		1.02	
belt width	w_{bit}	feet	NA		NA		NA		NA		NA	
meander width ratio	w_{bit}/W_{bkf}		NA		NA		NA		NA		NA	
linear wavelength ratio	LW		NA		NA		NA		NA		NA	
linear wavelength	LW/W_{bkf}		NA		NA		NA		NA		NA	
meander length	L_m	feet	NA		NA		NA		NA		NA	
meander length ratio	L_m/W_{bkf}		NA		NA		NA		NA		NA	
radius of curvature	R_c	feet	NA		NA		NA		NA		NA	
radius of curvature ratio	R_c/W_{bkf}		NA		NA		NA		NA		NA	

¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).

The existing conditions assessment of the on-site streams revealed similar conditions for UT3, UT4, and UT5. All three tributaries to Candy Creek are currently deeply incised, actively eroding, straightened, and disconnected from their corresponding floodplains (Section 1.1.1 - 1.1.3). UT3, UT4, and UT5 will be restored as C/E type streams according to the Rosgen classification system (Rosgen, 1996). Design for the tributaries is intended to create meandering streams with well-developed floodplains. Floodplain connectivity will be restored by implementing Priority 1 restoration where possible.

UT3 flows for 1,365 LF in stable condition, no restoration is proposed for this length of UT3. Beyond the initial stable portion of channel, UT3 has been heavily altered. To restore the system, UT3 will tie to the existing stable channel on the upstream end and be realigned through the center of a wide forested valley flowing northwest towards Candy Creek Reach 1C. Sinuosity will be increased to approximately 1.15 on the previously straightened channel. Dimension of the proposed UT3 was designed to reconnect the stream and floodplain and structures are proposed to provide a stable and improved bedform and an enhanced aquatic habitat. The previously installed farm crossing will be removed and minimal grading will be done in the left floodplain to ensure adequate floodplain width.

UT4 is deeply incised in its existing condition. As a result, the furthest upstream end of the project will be constructed as Priority 2 to facilitate the tie of the proposed channel with the existing upstream elevation. While the existing channel is heavily incised at the tie in location, a bedrock feature exists to ensure a stable connection. UT4 will be realigned to the center of the existing valley and an adequate bench will be cut for the 500 LF of constructed Priority 2 channel. The remaining length of UT4 will be restored by implementing Priority 1 restoration. The overall sinuosity of UT4 will be increased to 1.25 and structures will be added to increase bedform diversity and increase available aquatic habitat. Areas of the old abandoned channel will be utilized to create vernal pools which will provide open water habitat and floodplain storage.

Restoration for UT5 will begin at the confluence of UT5 and UT5A. The overall sinuosity of UT5 will be decreased slightly as the existing stream has created tight radius bends in the existing pattern which has led to continual erosion and mass wasting. The dimension of the proposed channel will reconnect UT5 to the floodplain and provide relief for channel banks during high flow events. Areas previously manipulated for farm crossings and/or abandoned impoundments will be restored to a natural valley condition with an adequate bench created for floodplain flow. Similar to UT4 areas of old abandoned channel will be used to create open water habitat and floodplain storage. One twelve foot wide permanent timber bridge is proposed for installation near the downstream end of UT5.

Table 14d. Design Morphological Parameters – Candy Creek Mitigation Site

	Notation	Units	UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max
stream type			C/E		C/E		C/E	
drainage area	DA	sq mi	0.12		0.30		0.21	
design discharge	Q	cfs	14		30		22	
bankfull cross-sectional area	A _{bkf}	SF	4.8		9.4		7.5	
average velocity during bankfull event	V _{bkf}	fps	3.1		3.2		3.0	
Cross-Section								

	Notation	Units	UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max
width at bankfull	w_{bkf}	feet	7.8		11.0		9.8	
maximum depth at bankfull	d_{max}	feet	0.9		1.2		1.1	
mean depth at bankfull	d_{bkf}	feet	0.6		0.9		0.8	
maximum depth ratio	d_{max}/d_{avg}		1.5		1.4		1.4	
bankfull width to depth ratio	w_{bkf}/d_{bkf}		12.7		12.9		12.8	
low bank height		feet	0.9		1.2		1.1	
bank height ratio	BHR		1.0		1.0		1.0	
floodprone area width	w_{fpa}	feet	17	100	24	135	22	100
entrenchment ratio	ER		2.2	12.8	2.2	12.3	2.2	10.2
Slope								
valley slope	S_{valley}	feet/foot	0.0158	0.0428	0.0120		0.0120	
channel slope ¹	S_{chnl}	feet/foot	0.0110	0.0320	0.0030	0.0120	0.0020	0.0100
Profile								
riffle slope	S_{riffle}	feet/foot	0.121	0.092	0.003	0.018	0.003	0.035
riffle slope ratio	S_{riffle}/S_{chnl}		1.1	1.8	1.1	1.5	1.5	3.5
pool slope	S_p	feet/foot	0.000	0.023	0.000	0.004	0.000	0.007
pool slope ratio	S_p/S_{chnl}		0.00	0.25	0.00	0.20	0.00	0.20
pool-to-pool spacing	L_{p-p}	feet	17	43	28	66	25	64
pool spacing ratio	L_{p-p}/w_{bkf}		2.2	5.5	2.5	6.0	2.5	6.5
pool cross-sectional area		SF	5.8	9.6	11.3	18.8	9.0	15.0
pool area ratio			1.2	2.0	1.2	2.0	1.2	2.0
maximum pool depth		feet	1.1	2.1	1.7	2.6	1.5	2.4
pool depth ratio			1.8	3.4	2.0	3.1	2.0	3.1

	Notation	Units	UT3		UT4		UT5	
			Min	Max	Min	Max	Min	Max
pool width at bankfull		feet	9.4	11.7	13.2	16.5	11.8	14.7
pool width ratio			1.2	1.5	1.2	1.5	1.2	1.5
Pattern								
sinuosity	K		1.15		1.22		1.20	
belt width	w_{bit}	feet	6	16	10	28	9	64
meander width ratio	w_{bit}/w_{bkf}		0.8	2.0	0.9	2.5	0.9	6.5
linear wavelength ratio	LW		27	86	39	121	34	108
linear wavelength	LW/w_{bkf}		3.5	11.0	3.5	11.0	3.5	11.0
meander length	L_m	feet	41	101	39	105	54	127
meander length ratio	L_m/w_{bkf}		5.3	13.0	3.5	9.5	5.5	13.0
radius of curvature	R_c	feet	10	27	14	28	13	49
radius of curvature ratio	R_c/w_{bkf}		1.3	3.5	1.3	2.5	1.3	5.0

¹ Minimum and maximum channel slope is reported as the variation in average channel slope in different segments of the reach, where-as valley slope is the overall drop from start of reach to end of reach (channel slope can be larger than valley slope).

9.4 Sediment Transport Analysis

The initial step in a sediment transport analysis is to perform a stream and watershed assessment to determine existing and future sediment supply. This is accomplished by walking the stream channels, observing the upland land uses and potential changes, and examining historical aerials. This is necessary to qualitatively understand the sediment supply for the design reaches and to determine the potential for changing land uses within the watershed.

A watershed assessment was conducted for the project as summarized in Section 4.1 and 4.2 of this document. Historical land use changes within the watershed were analyzed through aerial photo review and the existing conditions were evaluated on the ground. Wildlands was able to visit and observe almost the entire Candy Creek watershed due to the fact that the project parcels extend to the watershed boundary. Almost every significant tributary flowing into Candy Creek originates at a pond, which serves as a sediment sink. Future land use changes were determined to be insignificant based on historical trends and the rural character of the surrounding area. The existing watershed conditions have been consistent over an extended period of time, with minor exceptions. Sediment contributions from the watershed are deemed to be stable and are not expected to vary in the future. Candy Creek and some of the tributaries show signs of sediment deposition and aggradation, through visual observations of sediment accumulation and reported d_{50} values for the pavement and sub-pavement samples of less than 2mm. Based on observed watershed stability, this sediment can be largely attributed to local bank erosion within

the project streams. Degradation of the project streams can be attributed to cattle trampling and the propagation of head cuts. These observations suggest that the sediment load is predominantly contributed by local factors within the project corridor, and that the sediment load contributed by the upstream watershed beyond the project limits is relatively low.

9.4.1 Capacity Analysis

For watersheds with rapidly changing land uses and for streams with visual signs of high bedload supply, a detailed capacity analysis along with field data collection may be necessary for proper design. Based on the watershed assessment described above, the project streams currently appear to be supply limited (e.g. have capacity to move a sediment load greater than the supplied load). There is no reason to believe that the watershed will be altered in the future to increase the sediment yield. Most of the restoration reaches have been designed to maintain or exceed the competency of the existing channels, and grade control structures (detailed in Section 9.6) have been utilized to prevent future incision.

9.4.2 Competence Analysis

In natural streams, the shear stress in a channel increases corresponding to an increase in discharge until the point at which the stream is flowing full and gains access to the floodplain. The floodplain access disperses the flow and prevents further increases in shear stress within the channel. This relationship of shear stress, channel dimension and discharge influences erosion potential within the channel and the channel’s ability to transport certain sizes of sediment (competence). To support the competence analysis, the calculated shear stresses for both existing and proposed conditions along restoration reaches, were compared to determine if the proposed stream will be able to move the bed material within the channel and to support material sizing within the constructed riffles. The existing channels were modeled using a flowrate much higher than the design bankfull flow, as the larger existing channel size provides a higher discharge capacity. The proposed channels were modeled using their design bankfull flow. The competence analysis for each project reach is described below and the results are included in Table 15.

Table 15a. Sediment Transport Competence Analysis - Candy Creek Mitigation Site

Parameter	Candy Creek Reach 1	Candy Creek Reach 2	Candy Creek Reach 4	UT1C	UT1D
D ₅₀ of subpavement sediment sample (mm)	0.84	0.69	1.5	0.56	0.40
D ₈₅ of subpavement sediment sample (mm)	13	1.9	16	2.9	0.92
D ₁₀₀ of subpavement particle sampled (mm)	48	22	42	21	9.6
Shear Stress required to move D ₅₀ particle (lbs/ft ²)	0.01	0.01	0.02	0.01	0.01
Shear Stress required to move D ₈₅ Particle (lbs/ft ²)	0.18	0.03	0.22	0.04	0.01
Shear Stress required to move D ₁₀₀ particle (lbs/ft ²)	0.63	0.29	0.55	0.28	0.13
Existing Shear Stress (lbs/ft ²)	0.73	0.42	0.69	2.7	0.39
Movable Particle Size (mm) Shield curve	57	32	53	221	29
Proposed Shear Stress (lbs/ft ²)	0.45	0.50	0.46	0.31	0.50
Movable Particle Size (mm) Shield curve	34	38	35	23	38

Table 15b. Sediment Transport Competence Analysis - Candy Creek Mitigation Site

Parameter	UT2 Reach 1	UT3	UT4	UT5
D ₅₀ of subpavement sediment sample (mm)	0.86	9.6	9.3	5.7
D ₈₅ of subpavement sediment sample (mm)	16	23	27	20
D ₁₀₀ of subpavement particle sampled (mm)	69	66	58.67	39
Shear Stress required to move D ₅₀ particle (lbs/ft ²)	0.01	0.13	0.13	0.08
Shear Stress required to move D ₈₅ Particle (lbs/ft ²)	0.22	0.31	0.36	0.28
Shear Stress required to move D ₁₀₀ particle (lbs/ft ²)	0.89	0.85	0.76	0.51
Existing Shear Stress (lbs/ft ²)	1.8	0.93	0.55	1.9
Movable Particle Size (mm) Shield curve	140	72	42	149
Proposed Shear Stress (lbs/ft ²)	0.95	0.81	0.61	0.28
Movable Particle Size (mm) Shield curve	74	63	47	21

For all restoration reaches, with the exception of Candy Creek Reach 2, UT1D, and UT4, the proposed shear stress is less than the existing shear stress. The reduction in shear stress will reduce the likelihood of further bank scour, which will prevent fine sediment from being added to the system. The increases in calculated shear stress for Candy Creek Reach 2 and UT1D are a result of proposed channel slopes that are steeper than existing channel slopes. The existing channel bed slopes for Candy Creek Reach 2 and UT4 are relatively flat (0.25% and 0.28%, respectively) due to downcutting, while the Priority 1 channel slopes are steeper due to the natural valley slope (0.67% and 1.20% for Candy Creek Reach 2 and UT4, respectively). The majority of the elevation drop along UT1D is due to the two headcuts at the dam breach and confluence with Candy Creek. The rest of the existing channel profile is relatively flat. The slope used for shear stress calculations only considered the flatter section of channel and did not take the two headcuts into account. The proposed design spreads out the elevation drop from the two headcuts across the entire reach, resulting in a higher average slope than existing conditions. Grade control structures and coarse riffle material will prevent future incision in these reaches.

For Candy Creek Reach 1, Candy Creek Reach 4, UT3, UT4, and UT5, the proposed shear stress is able to entrain particles between the D₈₅ and D₁₀₀ of the subpavement. This means that the proposed channels have enough competence to avoid aggradation.

The competence analysis shows that, for Candy Creek Reach 2, UT1C, UT1D, and UT2 Reach 1, the proposed shear stress can entrain particles larger than the D₁₀₀ of the subpavement. Constructed riffles of coarse cobble material and log sills will be used for grade control to prevent incision on these reaches.

9.4.3 *Sediment Transport Analysis Summary*

The results of the sediment transport analysis and watershed assessment demonstrate that the design restoration reaches will have enough competency to move the supplied sediment load. Based on this qualitative analysis a threshold channel design is appropriate and no further monitoring or modeling of bedload supply and transport capacity is warranted. This conclusion is supported by the following facts and observations:

- The contributing rural watershed has remained stable for decades and is not expected to change in coming years.
- The major source of fines originates from the on-site channels, which will be reduced through restoration.

- There appears to be a negligible bedload of coarse material.

9.5 Project Implementation

9.5.1 Grading and Installation of Structures

Candy Creek Reaches 1, 2, and 4, UT1C, UT1D, UT2, UT3, UT4, and UT5 will be improved through a combination of Priority 1 and Priority 2 restoration. Priority 2 is necessary to transition the proposed channel into existing channel at upstream and downstream project limits, to match the channel elevation under the Hopkins Road Bridge, and when constructing a channel through the breached dams. New channels will be constructed offline for these reaches with stable meander patterns mimicking natural Piedmont streams, and the beds of the channels will be raised so that the floodplains are inundated during flow events larger than the design bankfull discharge. Where necessary, the floodplain will be reshaped or levies will be removed to improve function in overbank events. The streambeds will be composed of alternating riffle-pool sequences to provide habitat and flow diversity. The cross-sectional dimensions of the channels will be reconstructed as designed with stable side slopes that are matted and planted with native vegetation for long-term stability. Brush toe built from on-site materials will be part of the bank revetment to protect banks and provide aquatic habitat.

Enhancement I techniques will be utilized on the upstream portion of Candy Creek Reach 3, UT2 Reach 2, and UT2A. These reaches have some functional qualities that are desirable to preserve. This approach will enhance bed features and reduce the level of incision through benching and bank grading.

UT2B and the downstream portion of Candy Creek Reach 3 will be improved through Enhancement II practices. This will involve spot bank stabilization, minimal in-stream structures, invasive treatment and cattle exclusion.

In restoration reaches, structures will primarily include constructed riffles, angled log sills, log vanes and log-vane j-hooks, and rock sills. Several types of constructed riffles will be utilized in the restoration reaches to establish varied flow pattern, habitat, and grade control while providing a source of carbon for nutrient cycling. Native rock of various sizes (cobble, gravel, and fines) harvested on site will be used as much as possible to create these types of riffles. Types of riffles proposed for this Site include:

- Chunky riffles with cobble sized rock embedded throughout the length of the native rock riffle to provide additional habitat as well as grade control for steeper riffles.
- Native material riffles to re-establish a large gravel substrate to the channels.
- Woody riffles with brush and logs compacted into the bed of native rock to increase woody material in the channel.
- Jazz riffles to incorporate larger woody debris and meander the thalweg within longer riffles.

9.5.2 Riparian Vegetation

As a final stage of construction, riparian buffers of restoration and enhancement reaches will be seeded and planted with early successional native vegetation chosen to create a Piedmont Bottomland Forest community. The specific species composition to be planted was selected based on the community type, observations of the occurrence of species in the existing buffer, and best professional judgment on species establishment and anticipated Site conditions in the early years following project implementation. Species chosen for the planting plan are listed below.



Table 16a. Streambank Planting Zone – Candy Creek Mitigation Site

<i>Live Stakes and Herbaceous Plugs</i>						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Physocarpus opulifolius</i>	Ninebark	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	20%
<i>Cornus amomum</i>	Silky Dogwood	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40%
<i>Salix sericea</i>	Silky Willow	8 ft.	2-8 ft.	0.5"-1.5" cal.	Shrub	40%
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	N\A
<i>Carex alata</i>	Broadwing Sedge	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	N\A
						100%

Table 16b. Buffer Planting Zone – Candy Creek Mitigation Site

<i>Bare Root</i>						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Caliper Size	Stratum	# of Stems
<i>Alnus serrulata</i>	Tag Alder	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus phellos</i>	Willow Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Platanus occidentalis</i>	Sycamore	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Betula nigra</i>	River Birch	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Quercus pagoda</i>	Cherrybark Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	10%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Fraxinus pennsylvanica</i>	Green Ash	12 ft.	6-12 ft.	0.25"-1.0"	Canopy	15%
<i>Carpinus caroliniana</i>	Ironwood	18 ft.	6-18 ft.	0.25"-1.0"	Shrub	*
<i>Viburnum dentatum</i>	Arrowwood Viburnum	18 ft.	6-18 ft.	0.25"-1.0"	Shrub	*
						100%

*Within the existing wooded canopy, Ironwood and Arrowwood Viburnum are to be planted in lieu of Sycamore and River Birch.

Table 16c. Vernal Pool Planting Zone – Candy Creek Mitigation Site

Herbaceous Plugs						
Species	Common Name	Max Spacing	Indiv. Spacing	Min. Size	Stratum	# of Stems
<i>Calamagrostis canadensis</i>	Bluejoint Grass	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	30%
<i>Carex alata</i>	Broadwing Sedge	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	35%
<i>Juncus effusus</i>	Common Rush	5 ft.	3-5 ft.	1.0"- 2.0" plug	Herb	35%
						100%

Table 16d. Permanent Riparian Seeding– Candy Creek Mitigation Site

Pure Live Seed (20 lbs/ acre)				
Approved Date	Species Name	Common Name	Stratum	Density (lbs/acre)
All Year	<i>Panicum rigidulum</i>	Redtop Panicgrass	Herb	3.0
All Year	<i>Agrostis hyemalis</i>	Winter Bentgrass	Herb	3.0
All Year	<i>Chasmanthium latifolium</i>	River Oats	Herb	2.0
All Year	<i>Rudbeckia hirta</i>	Blackeyed Susan	Herb	1.0
All Year	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis	Herb	1.0
All Year	<i>Carex vulpinoidea</i>	Fox Sedge	Herb	3.0
All Year	<i>Panicum clandestinum</i>	Deertongue	Herb	3.0
All Year	<i>Elymus virginicus</i>	Virginia Wild Rye	Herb	2.0
All Year	<i>Asclepias syrica</i>	Common Milkweed	Herb	0.2
All Year	<i>Baptisia australis</i>	Blue False Indigo	Herb	0.2
All Year	<i>Gaillardia pulchella</i>	Annual Gaillardia	Herb	1.0
All Year	<i>Echinacea purpurea</i>	Pale Purple Coneflower	Herb	0.6

The riparian buffer areas will be planted with bare root seedlings. In addition, the top of stream banks will be planted with live stakes and the channel toe will be planted with herbaceous plugs. Permanent herbaceous seed will be placed on stream banks, floodplain areas, and all disturbed areas within the

project easement. The target communities for the restored riparian buffer zone will be based on the following:

- Reference conditions from forested areas at the reference reaches used in this project;
- Native trees with proven success in early successional restoration sites;
- Vegetation listed for these community types in Classification of the Natural Communities of North Carolina (Schafale and Weakley,1990); and
- Consultation with native tree suppliers.

To help ensure tree growth and survival, soil amendments may be added to excavated areas near the dam breach areas on UT1C and UT2. Soil tests will be performed in areas of cut; fertilizer and lime will be applied based on the results. Additionally, topsoil will be stockpiled, reapplied, and disked before permanent seeding and planting activities take place.

Species planted as bare roots will be spaced at an initial density of 605 plants per acre based on 12-ft by 6-ft spacing (targeted densities after monitoring year 3 are 320 woody stems per acre). Live stakes will be planted on top of channel banks at a 2-ft to 3-ft spacing on the outside of meander bends and a 6-ft to 8-ft spacing on tangent sections.

Invasive species within the riparian buffers will be treated at the time of construction. The extent of invasive species coverage will be monitored, mapped and controlled as necessary throughout the required monitoring period.

Existing woody species will potentially be subject to increased stress arising from channel and floodplain construction, including disturbance of soil near the root zone and a higher water table. Efforts to minimize disturbance along the dripline will encourage survival of important legacy trees. It is possible that these stresses could result in mortality of some individuals, due to greater susceptibility to infection by insects or disease during this time. However many trees also exhibit markedly increased seed production as a response to stress. Therefore, minor stress may opportunistically promote understory regeneration. Due to the dynamic nature of riparian floodplains, most of the listed bottomland forest species are specially adapted to handling a wide variety of hydrologic conditions. There will be a greater impact to upland species specifically in areas where soil saturation during the growing season becomes a chronic stressor. However, standing dead and fallen logs provide important habitat and biochemical roles in a functioning forested ecosystem, therefore the death of mature trees should not be considered a total loss. Smaller riparian understory species, (*L. benzoin*, *M. virginiana*) will likely be most impacted by grading and construction activities.

9.5.3 Fencing Installation

Permanent five strand barb wire fencing will be installed along the easement on the parcels with adjacent pastures. Temporary fencing will be installed before construction and maintained throughout the construction phase for cattle management.

Four of the ten easement crossings will be used for cattle crossings. Two of these (Candy Creek Reach 3 and UT2 Reach 1) will be culverts kept open for free access by the cattle. Permanent fencing at these two locations will be installed along each side of the easement crossing perpendicular to the stream. The other two crossings will be fords. Easement language specifies that the fords can only be used by cattle while actively crossing the stream; cattle will not have access while grazing. Fencing at these two locations will consist of double gates on each end of the crossing and spring loaded high tensile wire within the crossing that can be operated by the farmer during crossing events.



9.5.4 Wetlands

Thirty five pockets of wetlands, totaling approximately 2.18 acres, were identified within or immediately adjacent to the project area. The proposed plan calls for protecting and preserving approximately 1.50 acres of these wetlands. As detailed in Section 5.1, some of these wetland areas will be permanently impacted by the project. The majority of the permanent impacts occur on the wetland upstream of the pond being removed on UT2. Wetlands will be flagged and protected prior to and during construction to limit adverse impacts. Based on similar project sites with Priority 1 restoration, the footprint of the adjacent wetlands is expected to increase due to higher groundwater elevations. Although no credit is being claimed as part of the proposed mitigation plan, the protection and potential expansion of existing on-site wetlands is an important ecological benefit of the Site.

10.0 Maintenance Plan

The Site shall be monitored on a regular basis and a physical inspection of the Site shall be conducted a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These Site inspections may 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 17. Maintenance Plan - Candy Creek Mitigation Site

Component/Feature	Maintenance through project close-out
Stream	Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing of loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel. Areas where storm water and floodplain flows intercept the channel may also require maintenance to prevent bank erosion. Beaver dams that inundate the streams channels shall be removed and the beaver shall be trapped.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be treated 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.

11.0 Performance Standards

The performance criteria for the project Site will follow approved performance criteria presented in the DMS Mitigation Plan Template (version 2.2, 6/08/2012), and the Stream Mitigation Guidelines issued in April 2003 by the USACE and NCDWR. Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. The project will be assigned specific performance criteria components for hydrology, vegetation, and morphology. Performance criteria will be evaluated



throughout the seven year post-construction monitoring. If all performance criteria have been successfully met and two bankfull events have occurred during separate years, Wildlands may propose to terminate stream and/or vegetation monitoring after five pending little to no prevalent invasive species issues. An outline of the performance criteria components follows.

11.1 Streams

11.1.1 Dimension

Riffle cross-sections on the restoration and enhancement (EI) reaches should be stable and should show little change in bankfull area, maximum depth ratio, and width-to-depth ratio. Per DMS guidance, bank height ratios shall not exceed 1.2 and entrenchment ratios shall be at least 2.2 for restored channels to be considered stable. All riffle cross-sections should fall within the parameters defined for channels of the appropriate stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Indicators of instability include a trend of a vertically incising thalweg or system-wide eroding channel banks. Changes in the channel that indicate a movement toward stability or enhanced habitat include a decrease in the width-to-depth ratio in meandering channels or an increase in pool depth. Remedial action would not be taken if channel changes indicate a movement toward stability.

11.1.2 Pattern and Profile

Visual assessments and photo documentation should indicate that streams are remaining stable and do not indicate a trend toward vertical or lateral instability. Longitudinal profiles will not be collected during the monitoring period unless observations indicate lack of stability.

11.1.3 Substrate

Substrate materials in the restoration and enhancement level I reaches should indicate a progression towards or the maintenance of coarser materials in the riffle features and smaller particles in the pool features.

11.1.4 Photo Documentation

Photographs should illustrate the site's vegetation and morphological stability on an annual basis. Cross-section photos should demonstrate no excessive erosion or degradation of the banks. Longitudinal photos should indicate the absence of persistent bars within the channel or vertical incision. Grade control structures should remain stable. Deposition of sediment on the bank side of vane arms is preferable. Maintenance of scour pools on the channel side of vane arms is expected.

11.1.5 Hydrology

Two bankfull flow events must be documented within the seven-year monitoring period for every Restoration and Enhancement I reach. The two bankfull events must occur in separate years. Stream monitoring will continue until success criteria in the form of two bankfull events in separate years have been documented. Consistent flow must be documented in intermittent streams on the project site including UT1D. Under normal circumstances stream flow must be documented to occur every year for at least 30 consecutive days during the seven year monitoring period. Stream flow must also be documented to occur intermittently in all months other than July through September of each monitoring year.



11.2 Vegetation

The final vegetative success criteria will be the survival of 210 planted stems per acre in the planted riparian and wetland areas at the end of the required monitoring period (year seven). The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of the third monitoring year and at least 260 stems per acre at the end of the fifth year of monitoring. If this performance standard is met by year five, stem density is trending towards success (i.e., vigor), and invasive species are not threatening ecological success, monitoring of vegetation on the Site may be terminated provided written approval is provided by the USACE in consultation with the NC Interagency Review Team. The extent of invasive species coverage will be monitored and treated as necessary throughout the required monitoring period (year five or seven).

11.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above.

12.0 Monitoring Plan

Using the DMS Baseline Monitoring Plan Template (version 2.0, 10/14/10), a baseline monitoring document and as-built record drawings of the project will be developed within 60 days of the planting completion and monitoring installation on the restored Site. Monitoring reports will be prepared in the fall of each year of monitoring and submitted to DMS. These reports will be based on the DMS Monitoring Report Template (version 1.5, 6/08/12). The monitoring period will extend seven years beyond completion of construction or until performance criteria have been met. All survey will be tied to grid.

12.1 Site Specific Monitoring

Project monitoring requirements are listed in more detail in Tables 18a – 18c. Approximate locations of the proposed vegetation plots and groundwater gage monitoring components are illustrated in Figure 11.

Table 18a. Monitoring Requirements – Candy Creek Mitigation Site – Candy Creek Restoration Reaches

Parameter	Monitoring Feature	Quantity/ Length by Reach							Frequency	Notes
		Candy Creek R1A	Candy Creek R1B	Candy Creek R1C	Candy Creek R2A	Candy Creek R2B	Candy Creek R4A	Candy Creek R4B		
Dimension	Riffle Cross Sections	3	1	1	3	1	3	2	Year 1, 2, 3, 5 and 7	1
	Pool Cross Section	2	1	0	2	1	3	1		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Substrate	Reach wide (RW), Riffle (RF) 100 pebble count	1 RW, 2 RF	1 RW, 1 RF	1 RW, 1 RF	1 RW, 3 RF	1 RW, 1 RF	1 RW, 3 RF	1 RW, 2 RF	Year 1, 2, 3, 5 and 7	
Hydrology	Crest Gage/ Transducer	2							Quarterly	3

Parameter	Monitoring Feature	Quantity/ Length by Reach							Frequency	Notes
		Candy Creek R1A	Candy Creek R1B	Candy Creek R1C	Candy Creek R2A	Candy Creek R2B	Candy Creek R4A	Candy Creek R4B		
Vegetation	CVS Level 2								Year 1, 2, 3, 5 and 7	
Exotic and nuisance vegetation									Annual	4
Project Boundary									Annual	5
Reference Photos	Photographs	42							Annual	

Table 18b. Monitoring Requirements – Candy Creek Mitigation Site – Tributary Restoration Reaches

Parameter	Monitoring Feature	Quantity/ Length by Reach							Frequency	Notes
		UT1C	UT1D	UT2 R1A	UT2 R1B	UT3	UT4	UT5		
Dimension	Riffle Cross Sections	1	1	1	1	1	3	3	Year 1, 2, 3, 5 and 7	1
	Pool Cross Section	1	0	0	1	0	3	2		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Substrate	Reach wide (RW), Riffle (RF) 100 pebble count	1 RW, 1 RF	1 RW, 1 RF	1 RW, 1 RF	1 RW, 1 RF	1 RW, 1 RF	1 RW, 3 RF	1 RW, 3 RF	Year 1, 2, 3, 5 and 7	
Hydrology	Crest Gage/ Transducer	1	1	1		1	1	1	Quarterly	3
Vegetation	CVS Level 2								Year 1, 2, 3, 5 and 7	
Exotic and nuisance vegetation									Annual	4
Project Boundary									Annual	5
Reference Photos	Photographs	23							Annual	



Table 18c. Monitoring Requirements – Candy Creek Mitigation Site – EI and EII Reaches

Parameter	Monitoring Feature	Quantity/ Length by Reach					Frequency	Notes
		Candy Creek R3	UT2 R1A	UT2 R2	UT2A	UT2B		
Dimension	Riffle Cross Sections	1	1	1	1	N/A	Year 1, 2, 3, 5 and 7	1
	Pool Cross Section	1	0	1	0	N/A		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	
Substrate	Reach wide (RW), Riffle (RF) 100 pebble count	1 RW, 1 RF	1 RW, 1 RF	1 RW, 1 RF	N/A	N/A	Year 1, 2, 3, 5 and 7	
Hydrology	Crest Gage/ Transducer	N/A			1	N/A	Quarterly	3
Vegetation	CVS Level 2						Year 1, 2, 3, 5 and 7	
Exotic and nuisance vegetation							Annual	4
Project Boundary							Annual	5
Reference Photos	Photographs	21					Annual	

1. Cross-Sections required for each reach were determined using two methods. Reaches that have a bankfull width (Wbkf) less than 10 ft, the number of proposed cross-sections was calculated using 2 cross-sections per 1,000 LF. Where the Wbkf was greater than 10 ft, the number of proposed cross-sections was calculated using 1 cross-sections per 20 bankfull widths.
2. Pattern will be assessed visually during semi-annual site visits. Longitudinal profiles will be conducted during monitoring years only if vertical stability appears to be a concern.
3. Crest gages and/or transducers will be inspected quarterly or semi-annually, evidence of bankfull events will be documented with a photo when possible. Transducers will be set to record stage once every hour. Device will be inspected and downloaded semi-annually.
4. Locations of exotic and nuisance vegetation will be mapped.
5. Locations of fence damage, vegetation damage, boundary encroachments, etc. will be mapped.

12.2 Streams

12.2.1 Dimension

Permanent cross-section will be installed along the stream restoration reaches, with riffle and pool sections in proportion to DMS guidance. Each cross-section will be permanently marked with pins to establish its location. Cross-section surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg. If moderate bank erosion is observed within permanent cross-sections during the monitoring period, an array of bank pins will be installed in the permanent cross-section where erosion is occurring for reaches with a bankfull width of greater than three feet. Bank pins will be installed on the outside bend of the cross-section in at least three locations (one in upper third of the pool, one at the permanent cross-section, and one in the lower third of the pool). Bank pins will be monitored by measuring exposed rebar and maintaining pins flush to bank to capture bank erosion

progression. Cross-section and bank pin survey (if applicable) will be conducted in monitoring years one, two, three, five, and seven.

12.2.2 Pattern and Profile

To insure accordance with design plans, a longitudinal profile will be performed as part of the baseline monitoring document and as-built record drawings of the project that will be developed within 60 days of the planting completion and monitoring installation on the restored Site. Additional longitudinal profile surveys will be conducted if problems are identified during the monitoring years. Monitoring will follow standards as described in the 2003 USACE and NCDWR Stream Mitigation Guidance for the necessary reaches.

12.2.3 Substrate

A reach-wide pebble count will be performed in each restoration and enhancement level I reach for classification purposes. A pebble count will be performed at each surveyed riffle to characterize the pavement. Substrate sampling will occur in years one, two, three, five, and seven.

12.2.4 Photo Documentation

Permanent reference photographs will be taken once a year to visually document stability for seven years following construction. Permanent markers will be established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year. Photos will be used to monitor restoration and enhancement stream reaches as well as vegetation plots and wetland areas.

Longitudinal reference photos will be established at the tail of riffles approximately every 200 LF along the channel by taking a photo looking upstream and downstream. Permanent cross-section photos looking upstream and downstream and vegetation plot reference photos will be taken at the same time as the stream and vegetation surveys are conducted (Years one, two, three, five, and seven). Reference photos will also be taken within wetland areas on an annual basis during the visual site assessment. The photographer will make every effort to consistently maintain the same area in each photo over time.

12.2.5 Hydrologic Events

Bankfull flow events will be documented using a crest gage or transducer, photographs, and visual assessments such as debris lines. The gages will be installed within a permanent surveyed riffle cross-section on the restored channels. The gages will be checked at each site visit to determine if a bankfull event has occurred. Photographs will be used to document the occurrence of debris lines and sediment deposition.

12.3 Vegetation

Vegetation monitoring plots will be installed and evaluated within the stream and wetland areas to measure the survival of the planted trees. The number of monitoring quadrants required is based on the 2003 USACE and NCDWR Stream Mitigation Guidance. The size of individual quadrants will be 100 square meters for woody tree species and shrubs. Vegetation assessments will be conducted following the Carolina Vegetation Survey (CVS) Level 2 Protocol for Recording Vegetation (2006).

The initial baseline survey will be conducted within 21 days from completion of site planting and used for subsequent monitoring year comparisons. The first annual vegetation monitoring activities will commence at the end of the first growing season, during the month of September. The restoration and enhancement sites will then be evaluated in years one, two, three, five, and seven between June 1 and September 31. Species composition, density, and survival rates will be evaluated on an annual basis by



plot and for the entire Site. Individual plot data will be provided and will include height, density, vigor, damage (if any), and survival. Planted woody stems will be marked annually as needed and given a coordinate, based off of a known origin, so they can be found in succeeding monitoring years. Mortality will be determined from the difference between the previous year's living planted stems and the current year's living planted stems.

12.4 Visual Assessments

Visual assessments will be performed along all stream corridors on an annual basis during the seven year monitoring period. Problem areas will be noted such as channel instability (i.e. lateral and/or vertical instability, in-stream structure failure/instability and/or piping, headcuts), vegetation health (i.e. low stem density, vegetation mortality, invasive species or encroachment), beaver activity, or livestock access. Areas of concern will be mapped and photographed accompanied by a written description in the annual report. Problem areas will be re-evaluated during each subsequent visual assessment. Should remedial actions be required, recommendations will be provided in the annual monitoring report.

13.0 Long-Term Management Plan

Upon approval for close-out by the Interagency Review Team (IRT) the Site will be transferred to the NCDEQ Division of Natural Resource Planning and Conservation's Stewardship Program. This party 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. Endowment funds required to uphold easement and deed restrictions shall be negotiated prior to Site transfer to the responsible party.

The NCDEQ Division of Natural Resource Planning and Conservation's Stewardship Program currently houses DMS stewardship endowments within the non-reverting, interest-bearing Conservation Lands Stewardship Endowment Account. The use of funds from the Endowment Account is governed by North Carolina General Statute GS 113A-232(d)(3). Interest gained by the endowment fund may be used only for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The NCDEQ Stewardship Program intends to manage the account as a non-wasting endowment. Only interest generated from the endowment funds will be used to steward the compensatory mitigation sites. Interest funds not used for those purposes will be re-invested in the Endowment Account to offset losses due to inflation.

14.0 Adaptive Management Plan

Upon completion of Site construction DMS will implement the post-construction monitoring protocols previously defined in this document. 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, DMS will notify the USACE of the need to develop a Plan of Corrective Action. The Plan of Corrective Action may be prepared using in-house technical staff or may require engineering and consulting services. Once the Corrective Action Plan is prepared and finalized DMS will:

- Notify the USACE as required by the Nationwide 27 permit general conditions.
- Revise performance standards, maintenance requirements, and monitoring requirements as necessary and/or required by the USACE.
- Obtain other permits as necessary.
- Implement the Corrective Action Plan.



- Provide the USACE a Record Drawing of Corrective Actions. This document shall depict the extent and nature of the work performed.

15.0 Financial Assurances

Pursuant to Section IV H and Appendix III of the DMS' In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environment and Natural Resources has provided the US Army Corps of Engineers Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by DMS. This commitment provides financial assurance for all mitigation projects implemented by the program.



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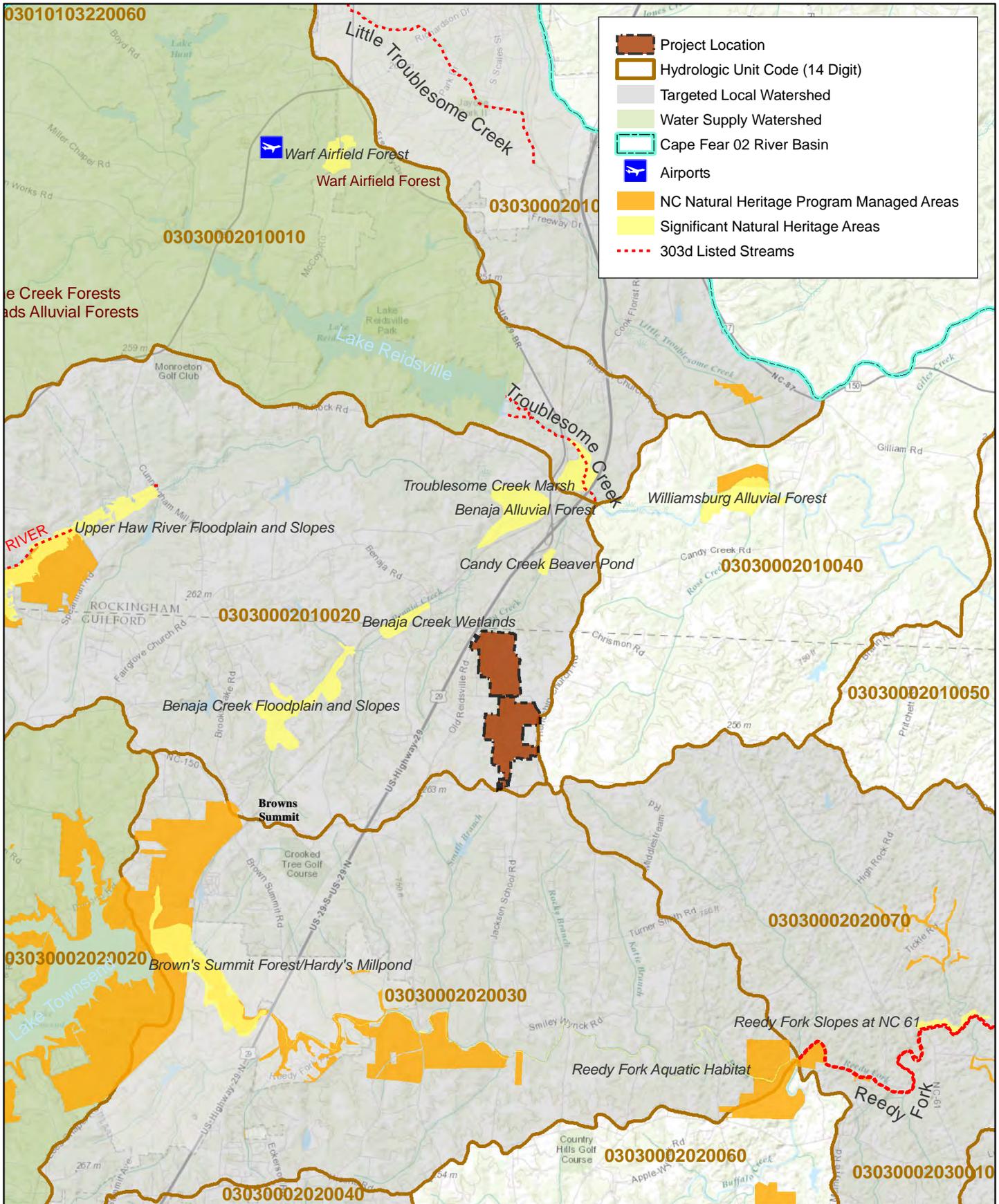
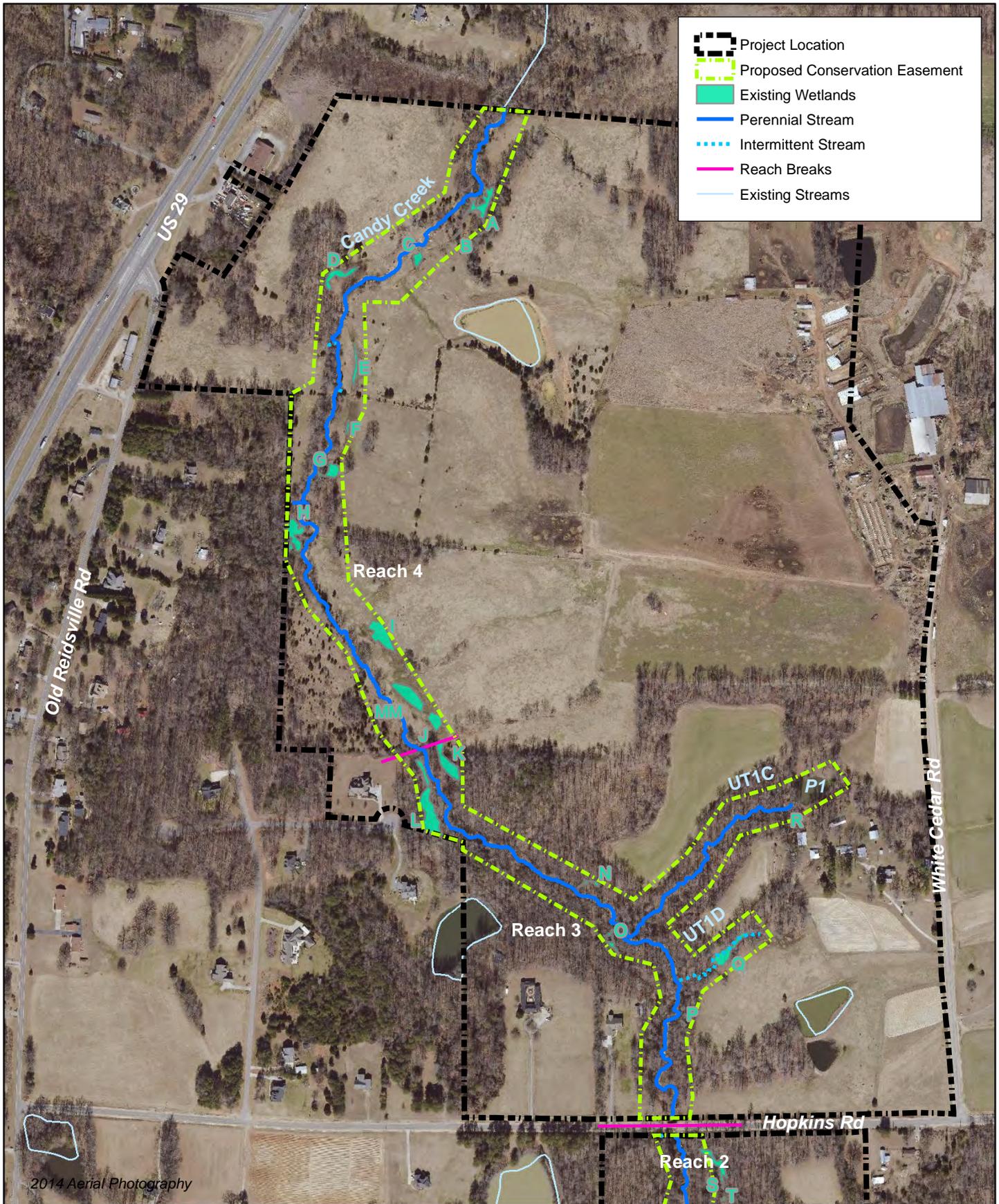


Figure 1 Vicinity Map
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

Guilford County, NC



-  Project Location
-  Proposed Conservation Easement
-  Existing Wetlands
-  Perennial Stream
-  Intermittent Stream
-  Reach Breaks
-  Existing Streams



Figure 2a Site Map (North)
 Candy Creek Mitigation Site
 Cape Fear River Basin (03030002)

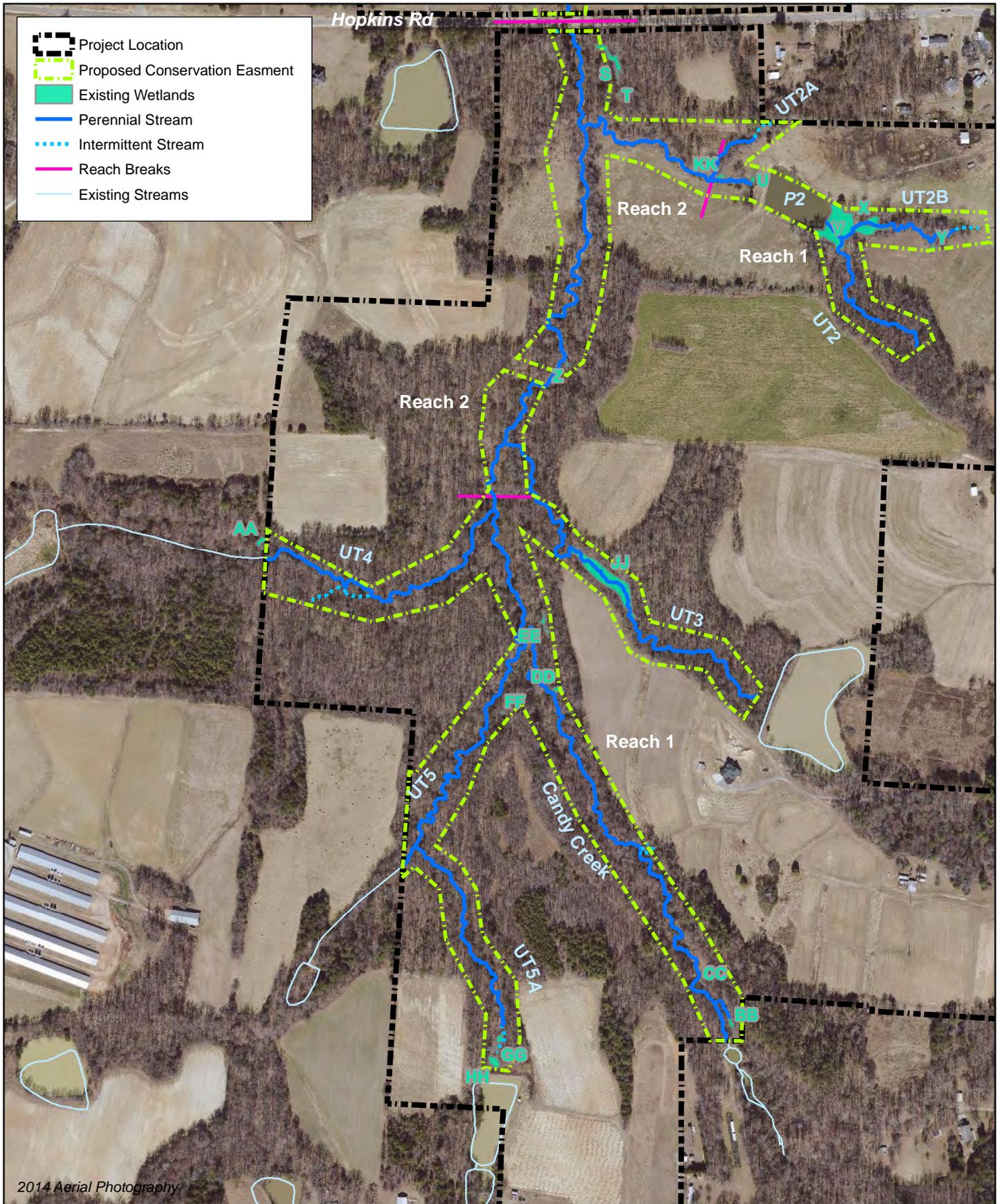


Figure 2b Site Map (South)
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

Guilford County, NC

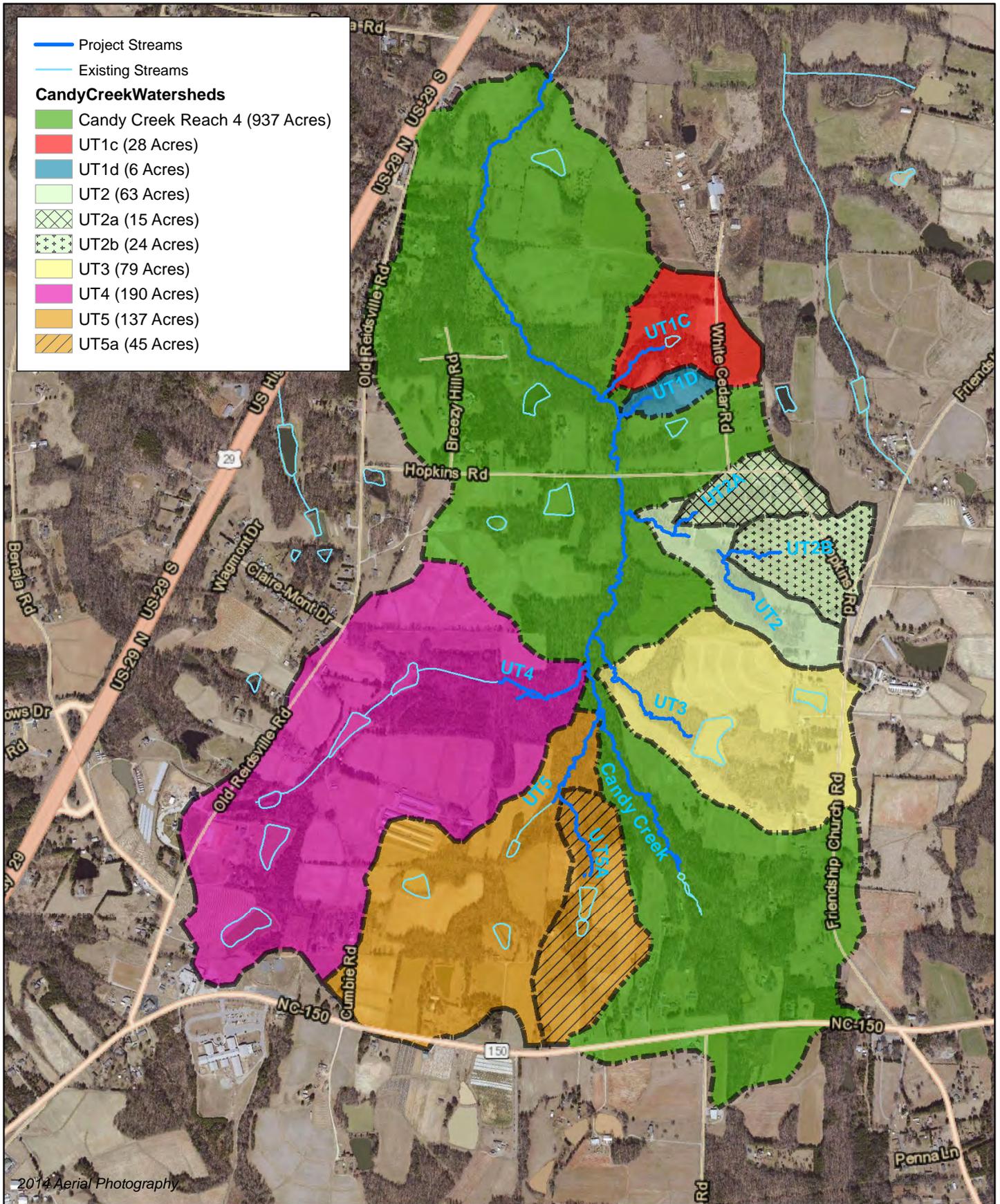
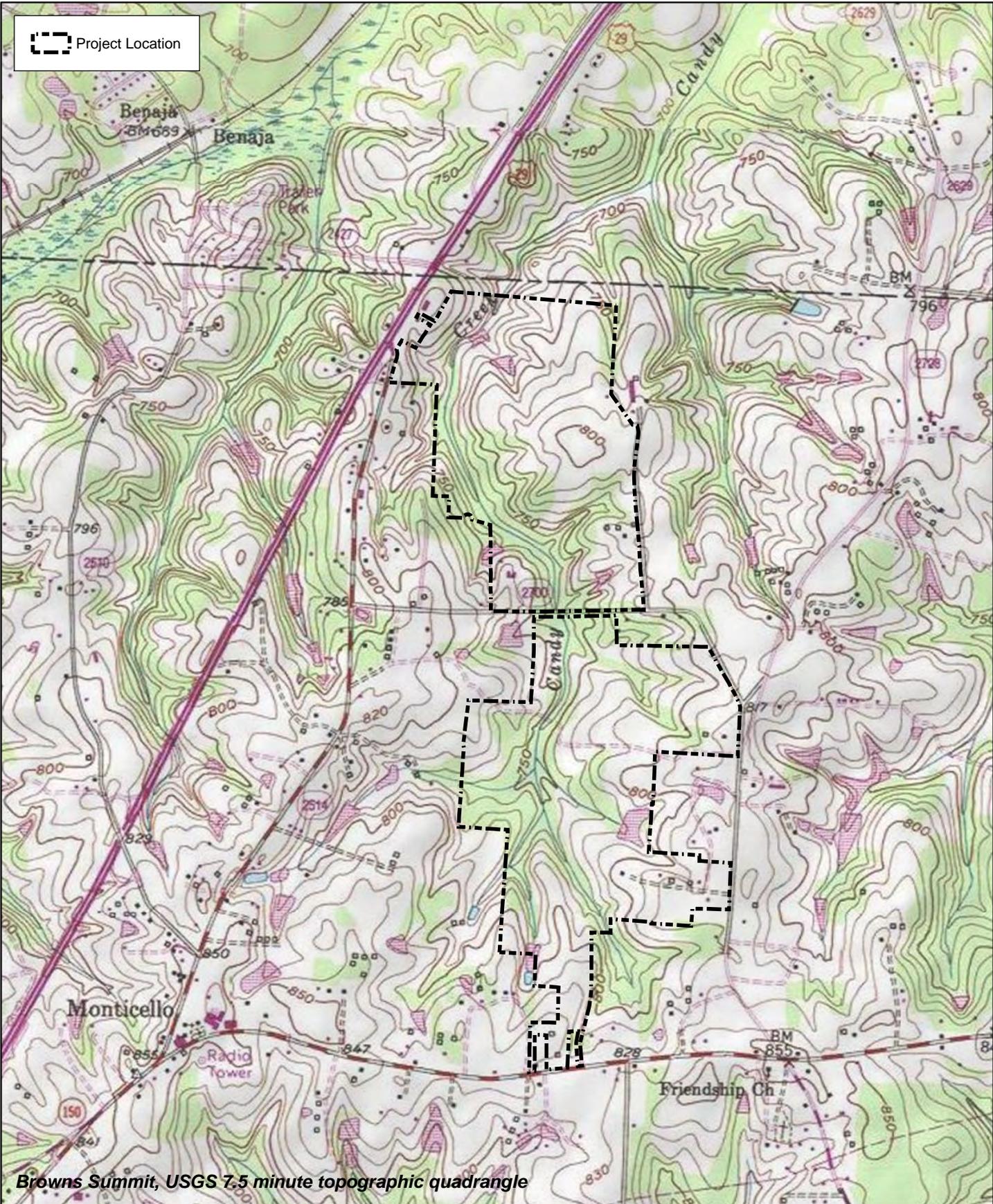


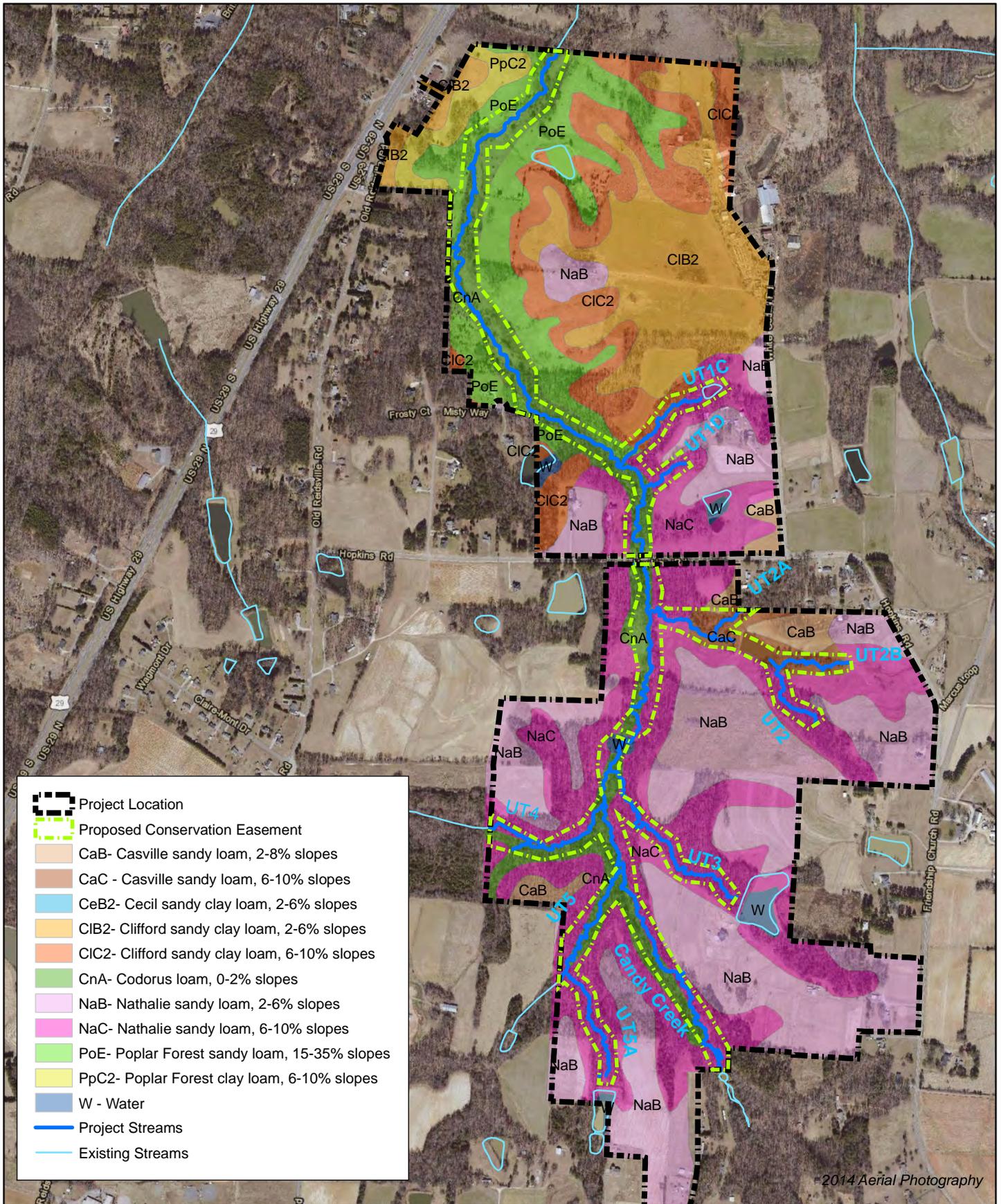
Figure 3 Watershed Map
 Candy Creek Mitigation Site
 Cape Fear River Basin (03030002)
 Guilford County



0 1,600 Feet



Figure 4 USGS Map
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)



0 1,000 Feet



Figure 5 Soils Map
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

Guilford County, NC



0 500 Feet



Figure 6a Hydrologic Features Map (North)
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

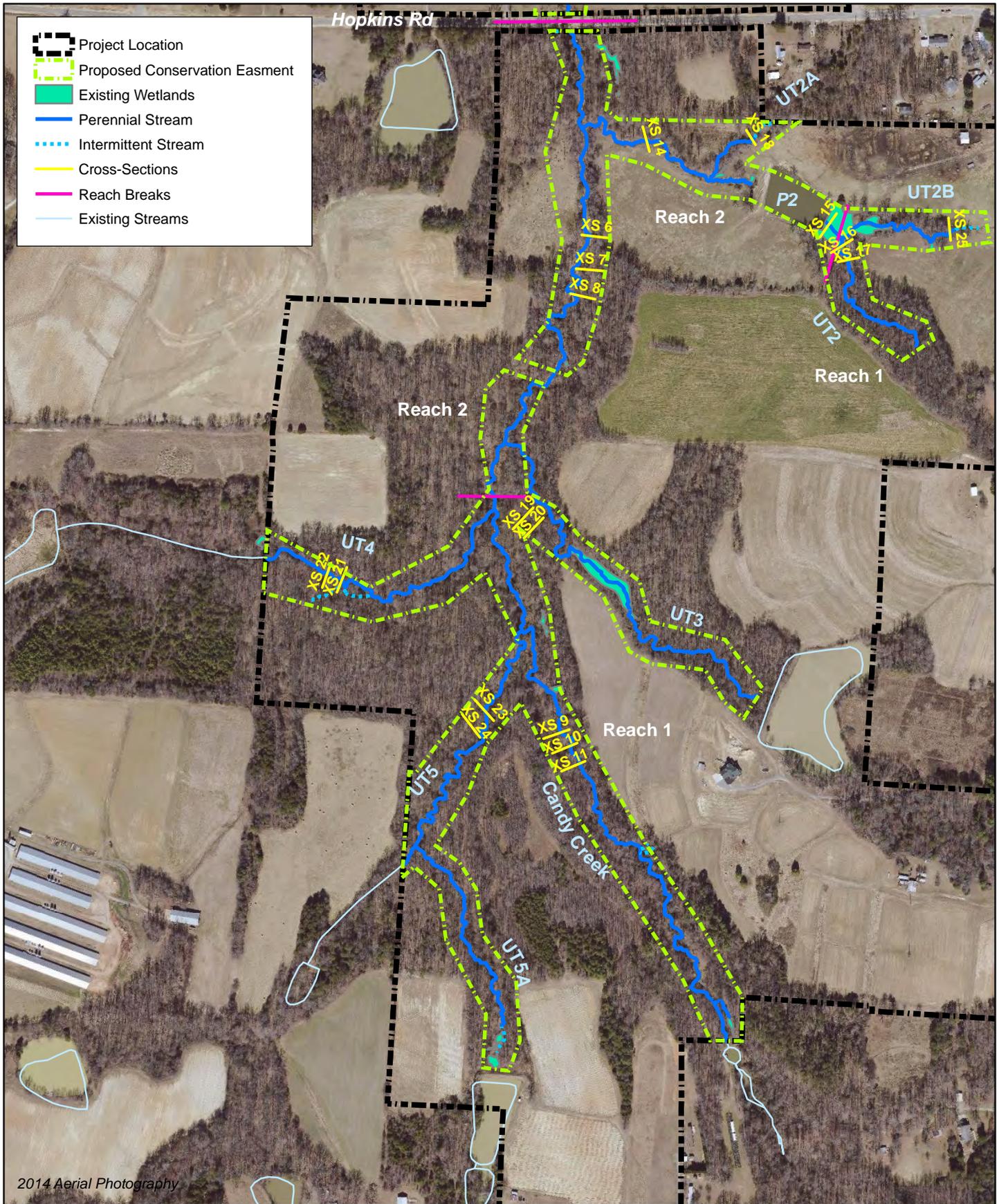


Figure 6b Hydrologic Features Map (South)
 Candy Creek Mitigation Site
 Cape Fear River Basin (03030002)



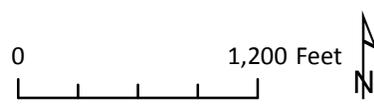
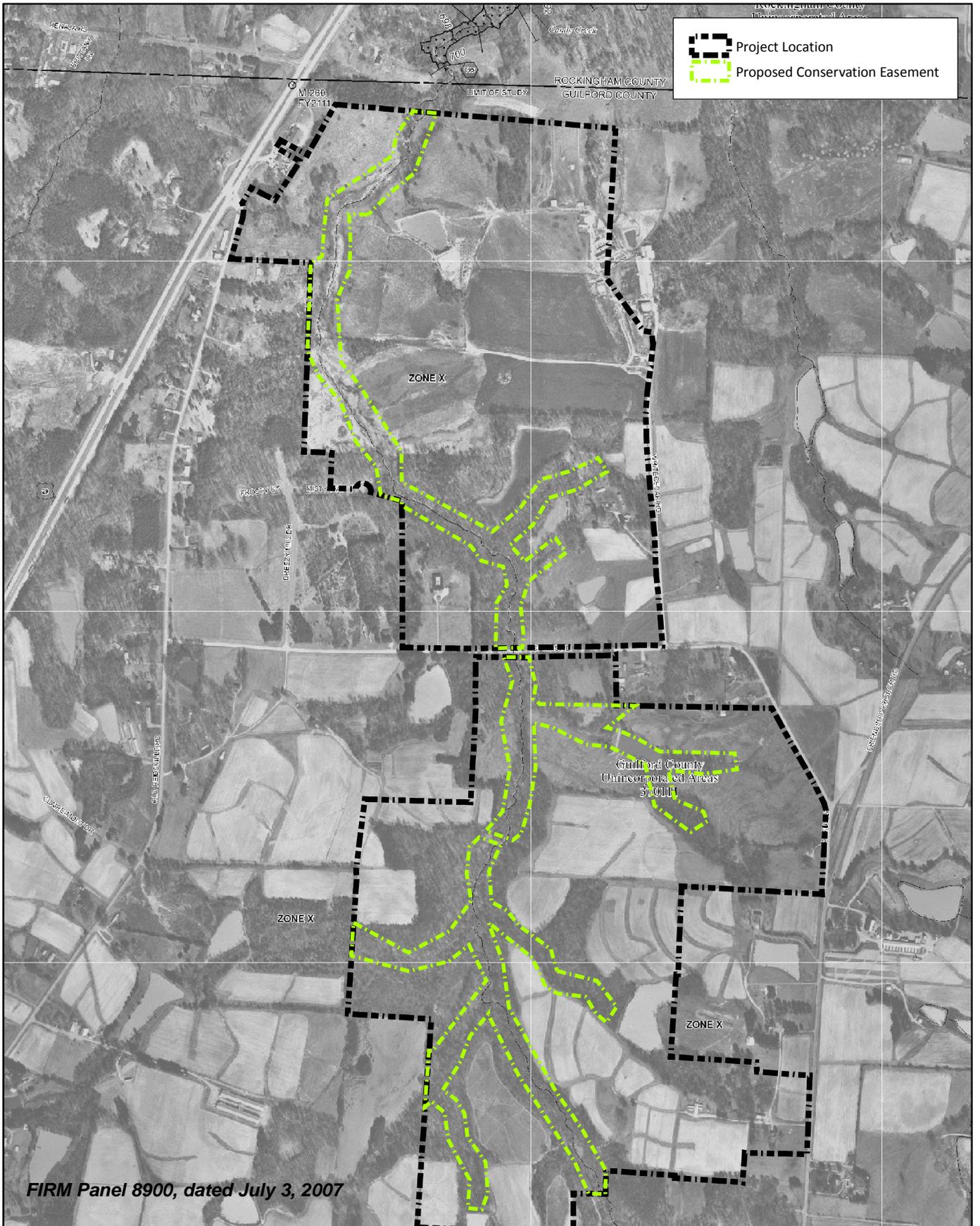


Figure 7 FEMA Map
 Candy Creek Mitigation Site
 Cape Fear River Basin (0303002)

Guilford County, NC

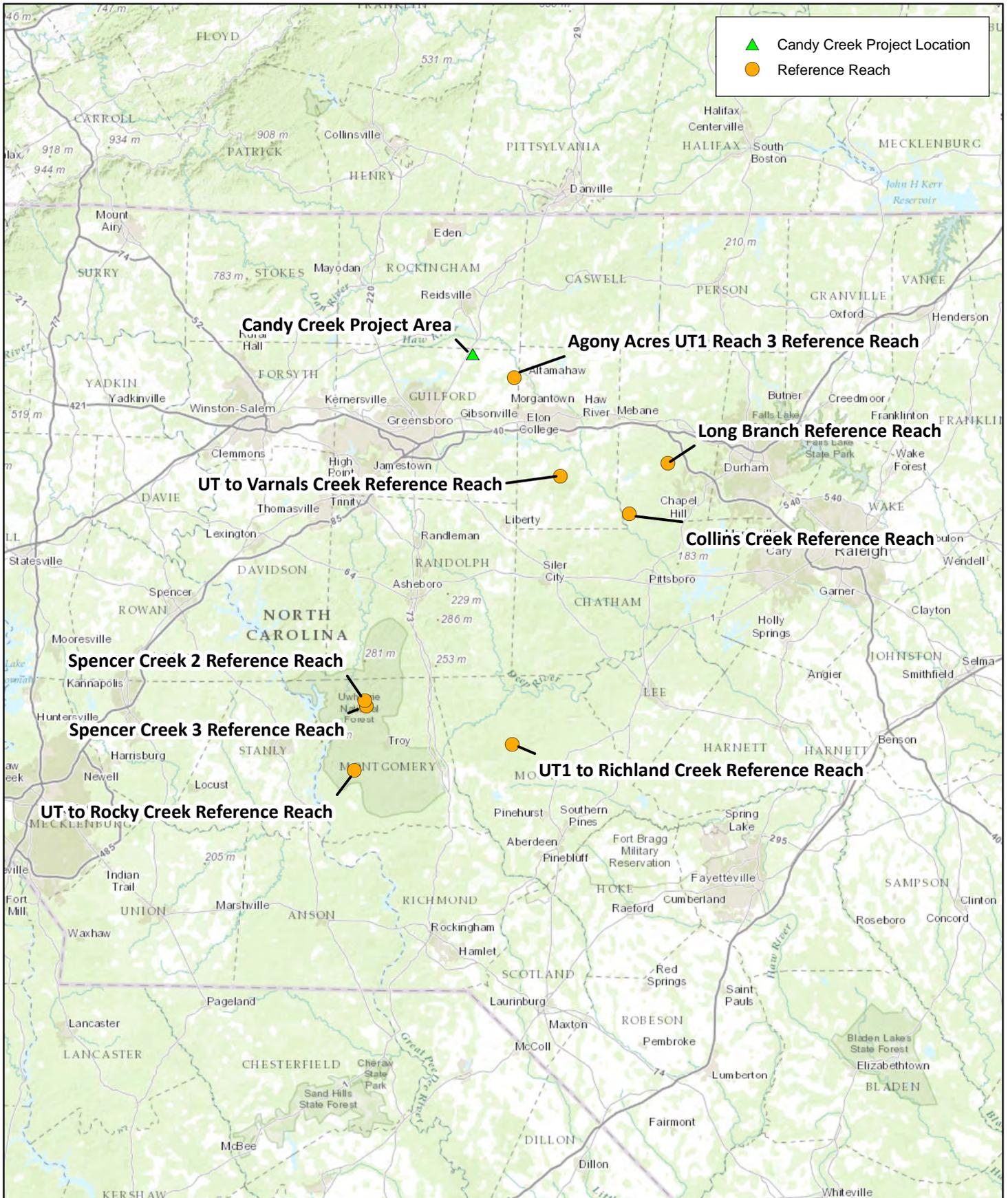
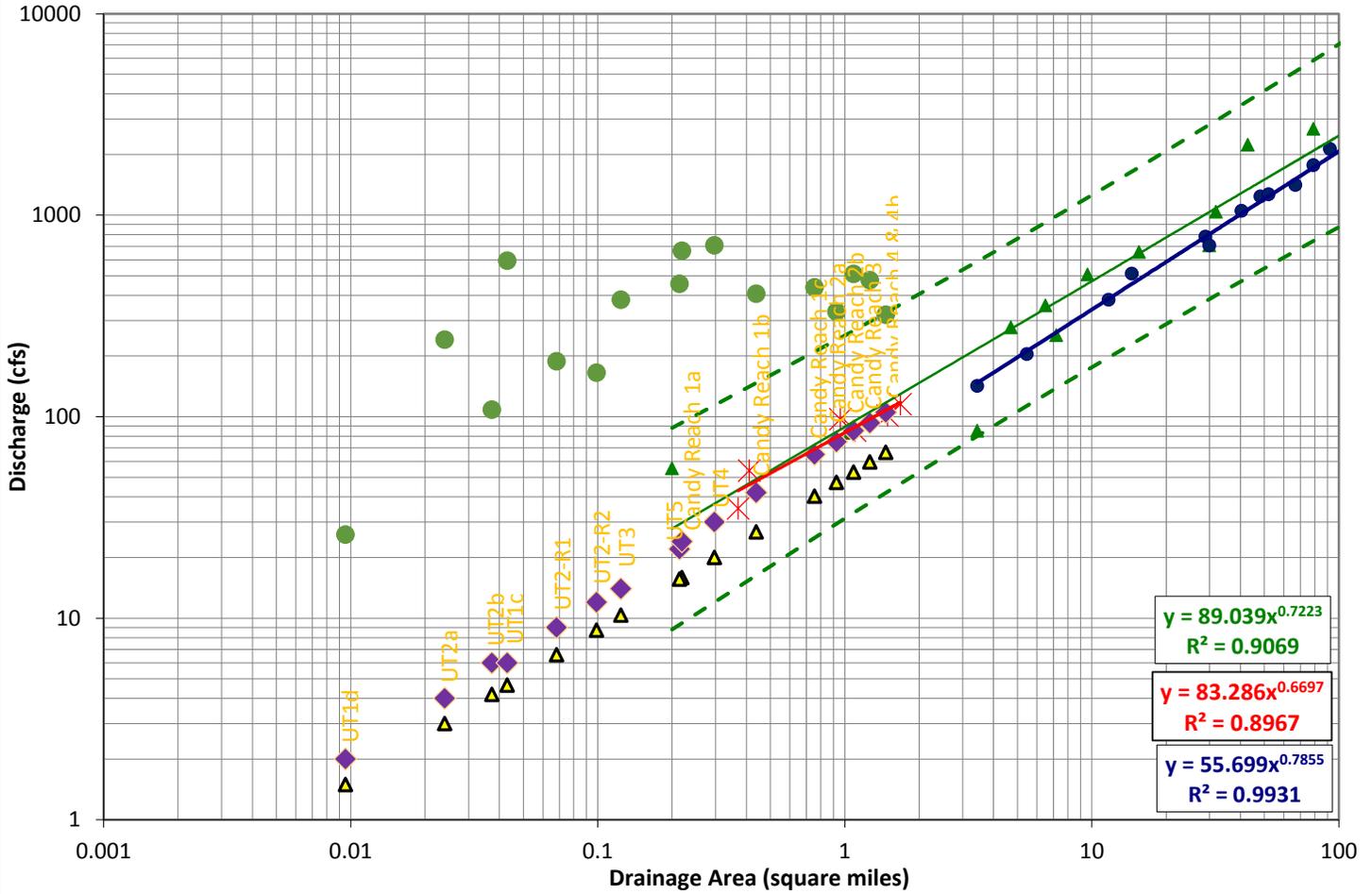


Figure 8 Reference Reach Vicinity Map
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

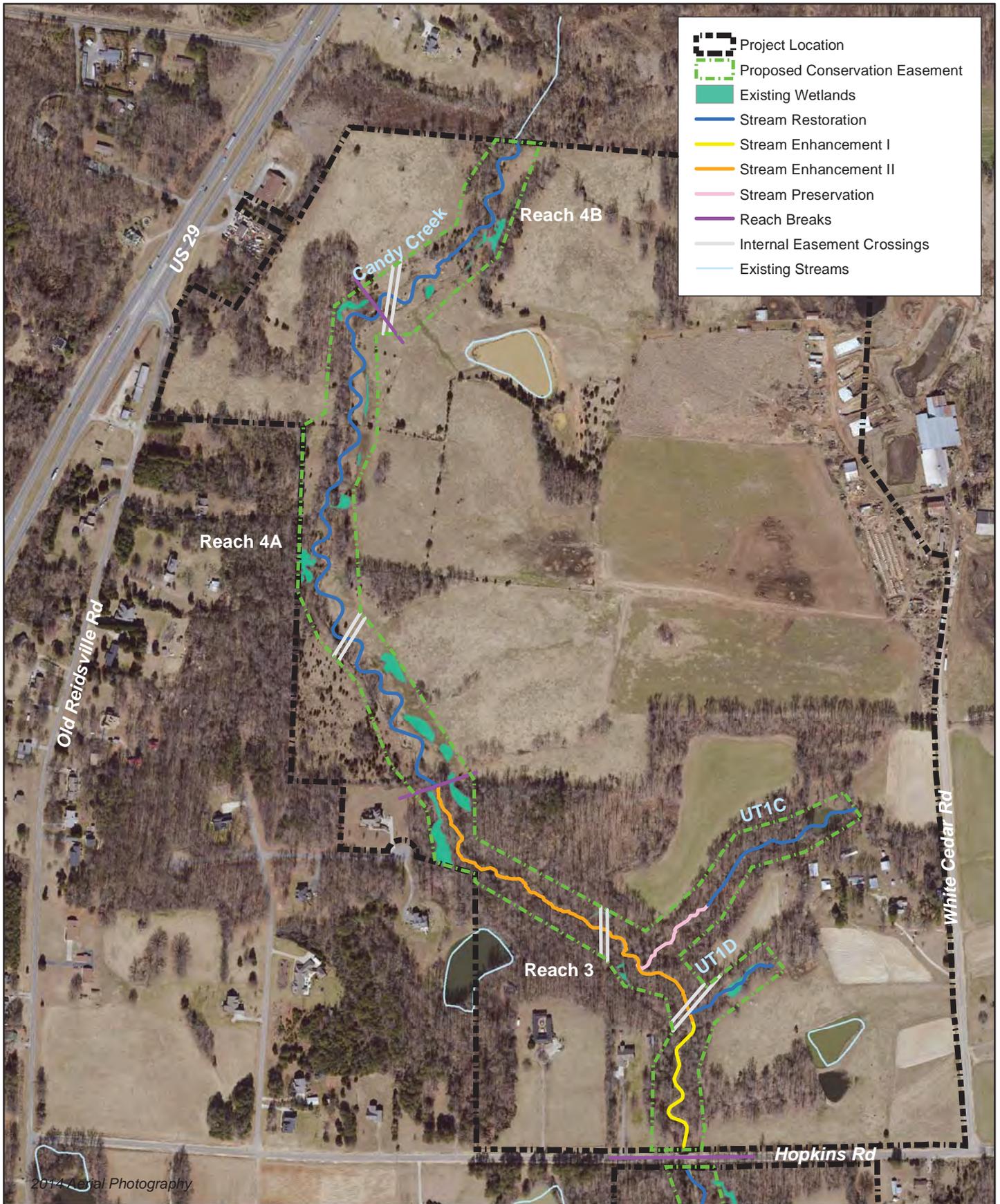
Candy Creek Design Discharge Plot



- ▲ Rural Data
- Rural Lower 95% Limit
- Qmax - Existing Site Streams
- ✖ Reference Reach Curve
- Alan Walker Curve
- Power (Rural Data)
- Power (Reference Reach Curve)
- Rural Upper 95% Limit
- ◆ Reference Reaches
- ▲ USGS Rural Piedmont 1.2-yr Predictions
- ◆ Design Discharges
- Power (Alan Walker Curve)



Figure 9 NC Piedmont Regional Curves with Project Data Overlay
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)



- Project Location
- Proposed Conservation Easement
- Existing Wetlands
- Stream Restoration
- Stream Enhancement I
- Stream Enhancement II
- Stream Preservation
- Reach Breaks
- Internal Easement Crossings
- Existing Streams

Figure 10a Concept Design Map (North)
 Candy Creek Mitigation Site
 Cape Fear River Basin (03030002)



0 500 Feet



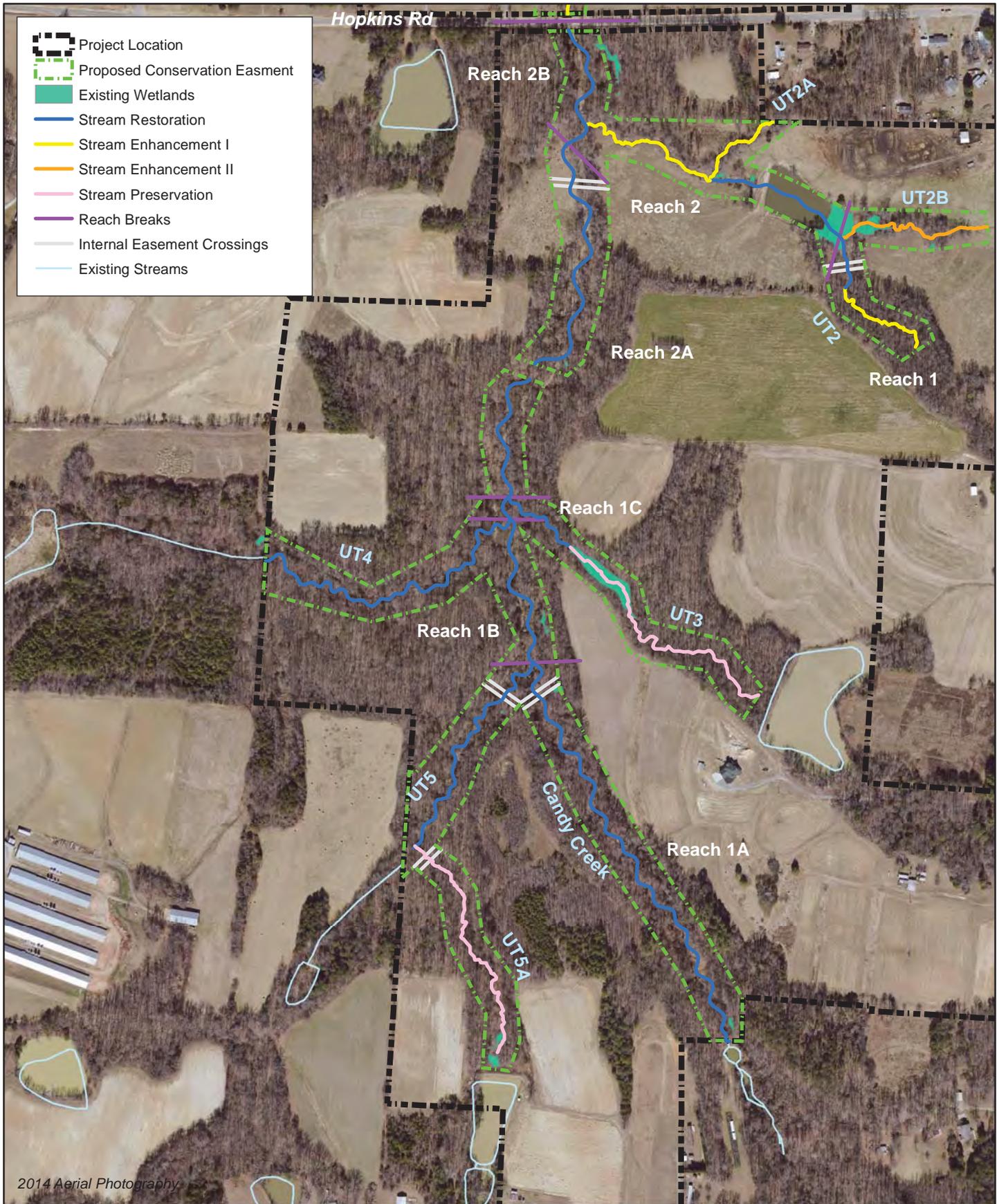
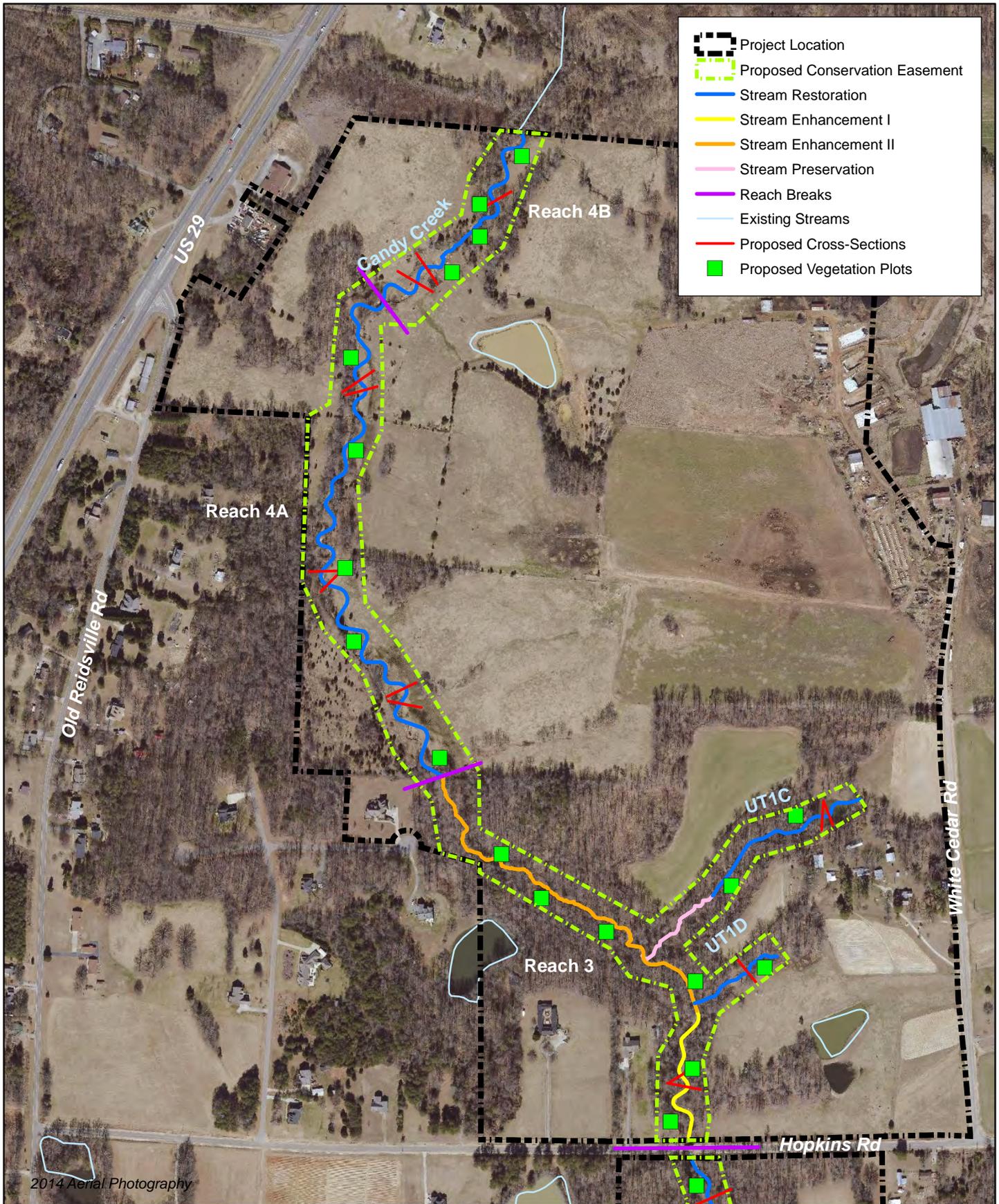


Figure 10b Concept Design Map (South)
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

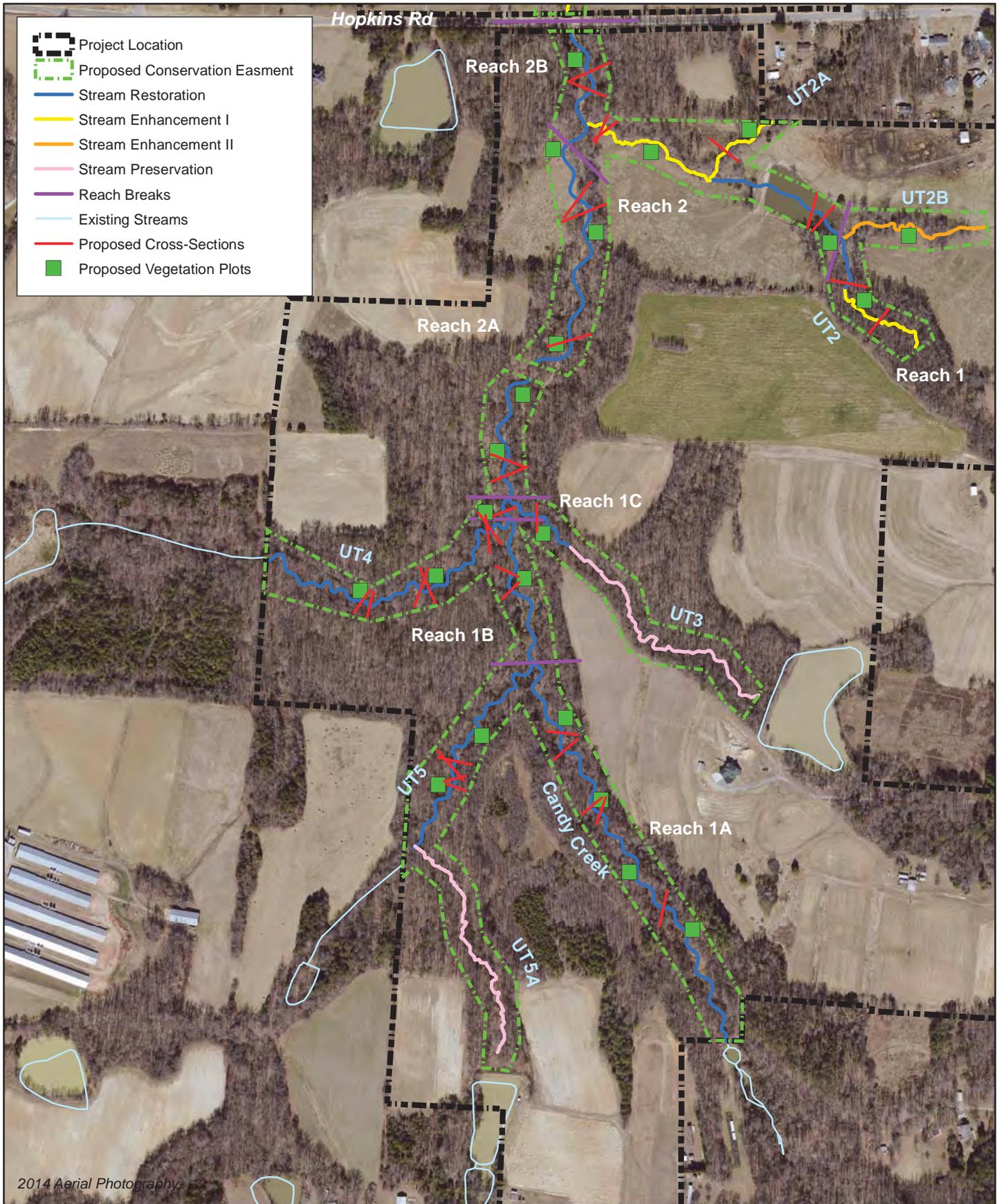


- Project Location
- Proposed Conservation Easement
- Stream Restoration
- Stream Enhancement I
- Stream Enhancement II
- Stream Preservation
- Reach Breaks
- Existing Streams
- Proposed Cross-Sections
- Proposed Vegetation Plots



Figure 11a Proposed Monitoring Components Map (North)
 Candy Creek Mitigation Site
 Cape Fear River Basin (03030002)

Guilford County, NC



2014 Aerial Photography



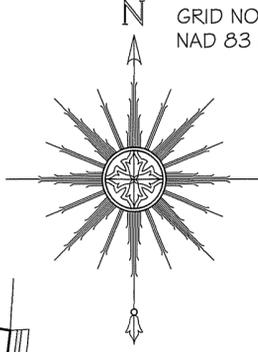
Figure 11b Proposed Monitoring Components Map (South)
Candy Creek Mitigation Site
Cape Fear River Basin (03030002)

**Appendix 1: Recorded Conservation Easement and Plat
(Site Protection Instrument)**

COVER SHEET FOR: CANDY CREEK STREAM MITIGATION SITE

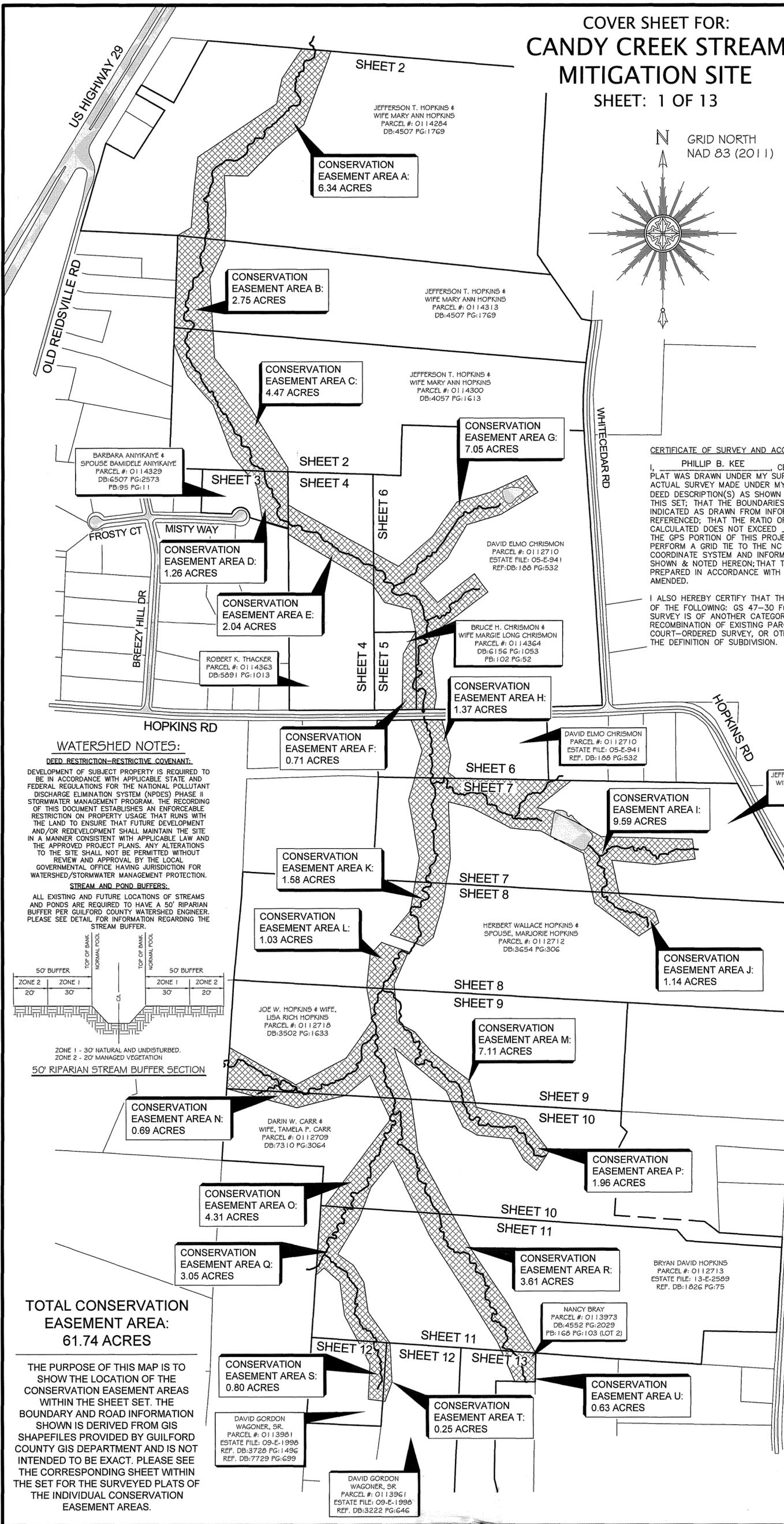
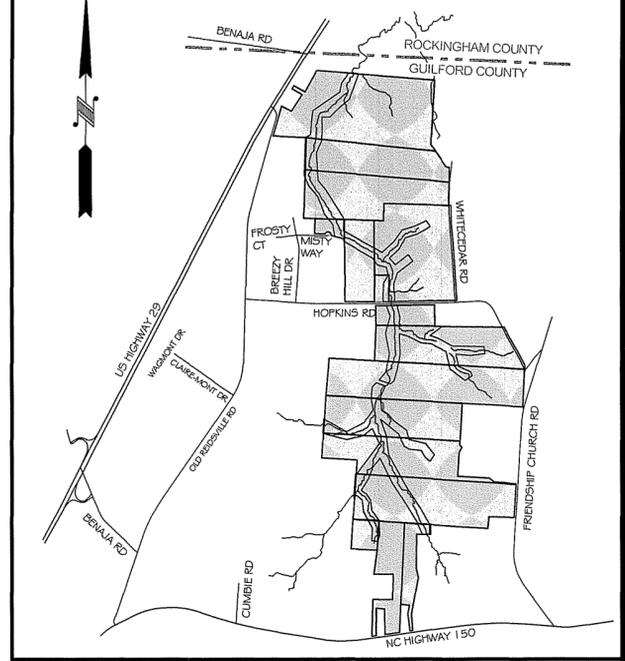
SHEET: 1 OF 13

GRID NORTH
NAD 83 (2011)



VICINITY MAP

SCALE: 1" = 2000'



CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) AS SHOWN ON EACH SHEET OF THIS SET; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEOID: 12A
AVERAGE COMBINED FACTOR: 99998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCRN, NCG5

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

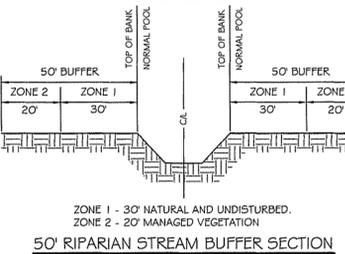
WATERSHED NOTES:

DEED RESTRICTION-RESTRICTIVE COVENANT:

DEVELOPMENT OF SUBJECT PROPERTY IS REQUIRED TO BE IN ACCORDANCE WITH APPLICABLE STATE AND FEDERAL REGULATIONS FOR THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PHASE II STORMWATER MANAGEMENT PROGRAM. THE RECORDING OF THIS DOCUMENT ESTABLISHES AN ENFORCEABLE RESTRICTION ON PROPERTY USAGE THAT RUNS WITH THE LAND TO ENSURE THAT FUTURE DEVELOPMENT AND/OR REDEVELOPMENT SHALL MAINTAIN THE SITE IN A MANNER CONSISTENT WITH APPLICABLE LAW AND THE APPROVED PROJECT PLANS. ANY ALTERATIONS TO THE SITE SHALL NOT BE PERMITTED WITHOUT REVIEW AND APPROVAL BY THE LOCAL GOVERNMENTAL OFFICE HAVING JURISDICTION FOR WATERSHED/STORMWATER MANAGEMENT PROTECTION.

STREAM AND POND BUFFERS:

ALL EXISTING AND FUTURE LOCATIONS OF STREAMS AND PONDS ARE REQUIRED TO HAVE A 50' RIPARIAN BUFFER PER GUILFORD COUNTY WATERSHED ENGINEER. PLEASE SEE DETAIL FOR INFORMATION REGARDING THE STREAM BUFFER.



BK: P 190
PG: 54-66
RECORDED: 201509058
11-03-2015
10:23:40 AM
BY: MEREDITH AAPPLE
DEPUTY:GB

201509058
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS
DEPUTY:GB
NC FEE \$273.00

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

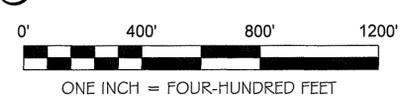
John R. Egan 9-16-15
PLANNING DIRECTOR DATE

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love 9-16-15
PLANNING DIRECTOR DATE

Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

Paul Love 9-17-15
REVIEW OFFICER DATE



EXCLUSION MAP

A FINAL PLAT OF
A CONSERVATION EASEMENT SURVEY FOR

THE STATE OF NORTH CAROLINA,
DIVISION OF MITIGATION SERVICES
"CANDY CREEK STREAM MITIGATION SITE"

SPO FILE NUMBERS:

41-AAAED, 41-AAAE, 41-AAAEF, 41-AAAG, 41-AAAH, 41-AAAI,
41-AAAEJ, 41-AAAK, 41-AAAL, 41-AAAM, 41-AAAN

DMS SITE ID: 98315

MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA

SURVEY BY: DD,KP,NC DRAWN BY: EC CHECKED BY: PBK
SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE

SHEET SIZE: 18"x24" SHEET #: 1 OF 13 SCALE: 1"=400'



P.O. Box 2566
Asheville, NC 28802
(828) 575-9021
www.keemap.com
License # C-3039

CASE NUMBER: 15-07-GCPL-03496

TOTAL CONSERVATION
EASEMENT AREA:
61.74 ACRES

THE PURPOSE OF THIS MAP IS TO SHOW THE LOCATION OF THE CONSERVATION EASEMENT AREAS WITHIN THE SHEET SET. THE BOUNDARY AND ROAD INFORMATION SHOWN IS DERIVED FROM GIS SHAPEFILES PROVIDED BY GUILFORD COUNTY GIS DEPARTMENT AND IS NOT INTENDED TO BE EXACT. PLEASE SEE THE CORRESPONDING SHEET WITHIN THE SET FOR THE SURVEYED PLATS OF THE INDIVIDUAL CONSERVATION EASEMENT AREAS.

BK: R 7756
PG: 909-921
RECORDED:
11-03-2015
11:43:21 AM
BY: MEREDITH A APPLE
DEPUTY-GB



2015059102

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$28.00

Excise Tax: \$28.00

STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

13^M P/u Isaacson

GUILFORD COUNTY

SPO File Number: 41-AAAED

DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Barbara and Bamidele Aniyikaiye, (“Grantor”), whose mailing address is 5305 Misty Way, Brown Summit, NC 27214, to the State of North Carolina, (“Grantee”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 3.12 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 6507 at Page 2573** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Area D containing a total of 1.26 acres as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Stream Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Barbara Aniyikaiye and Bamidele Aniyikaiye," dated Sept. 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

[Signature] (SEAL)
Barbara Aniyikaiye

[Signature] (SEAL)
Bamidele Aniyikaiye

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Barbara Aniyikaiye and Bamidele Aniyikaiye, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27th day of October, 2015.

[Signature]
Notary Public

My commission expires:
11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

**Barbara Aniyikaiye & Bamidele Aniyikaiye
SPO FILE NUMBER: 41-AAAED DMS SITE ID: 96315**

The following conservation easement area is located off of Misty Way within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Barbara Aniyikaiye and Bamidele Aniyikaiye through Deed Book 6507 Page 2573 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "D":

BEGINNING AT AN EXISTING 3/4" IRON PIPE (CORNER 17); said iron pipe being at a common corner of Deed Book 6507 Page 2573 and Deed Book 5891 Page 1013 and in a common line with Deed Book 4057 Page 1613 of the Guilford County Registry, and located S 89°02'36" W a horizontal ground distance of 1797.33 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet;

Thence with a common line of Deed Book 6507 Page 2573 and Deed Book 5891 Page 1013 and the conservation easement area S 00°25'35" E the following (3) distances:

- (1) 111.34 feet to an existing 3/4" iron pipe (CORNER 18);
- (2) 81.55 feet to a 5/8" rebar set with a CE cap (CORNER 19);
- (3) 132.25 feet to a 5/8" rebar set with a CE cap (CORNER 53); said rebar being located N 00°25'35" W a distance of 5.22 feet from a common corner of Deed Book 6507 Page 2573 and Deed Book 5216 Page 1471, and in a common line with Deed Book 5891 Page 1013 of the Guilford County Registry;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (3) courses and distances:

- (1) N 73°49'00" W a distance of 156.81 feet to a 5/8" rebar set with a CE cap (CORNER 54);
- (2) N 09°22'26" W a distance of 200.45 feet to a 5/8" rebar set with a CE cap (CORNER 55);
- (3) N 39°17'35" W a distance of 118.32 feet to a 5/8" rebar set with a CE cap (CORNER 56); said rebar being in a common line of Deed Book 6507 Page 2573 and Deed Book 4057 Page 1613, and located S 88°13'41" E a distance of 244.61 feet from an existing 1/2" iron pipe; said iron pipe being at a common corner of Deed Book 6507 Page 2573 and Deed Book 2946 Page 173, and in a common line with Deed Book 4057 Page 1613 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area

S 88°13'41" E a distance of 255.88 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.26 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Barbara Aniyikaiye and Bamidele Aniyikaiye; Job# 140431-CE, sheet 3. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 6507, PG: 2573, AND PB: 95, PG: 11; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEOID: 12A
AVERAGE COMBINED FACTOR: .99998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCR, NCGS



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

I, Paul Love, REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

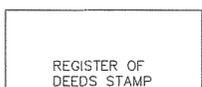
Paul Love
REVIEW OFFICER
DATE: 9-17-15

CERTIFICATE OF OWNERSHIP AND DEDICATION:

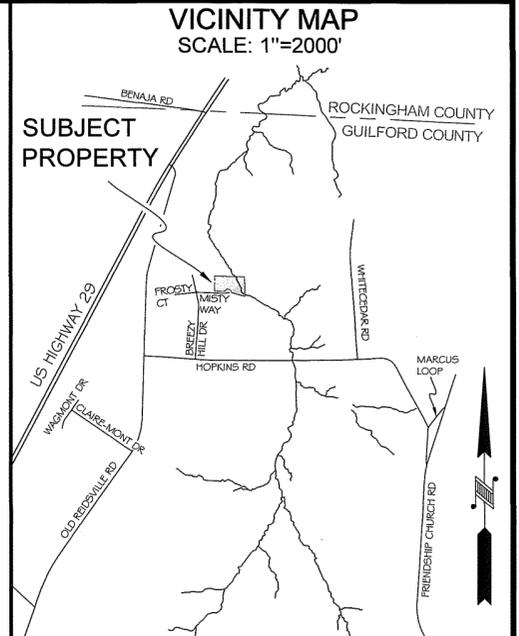
I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Barbara Aniyikaiye
DATE: 9-16-15

Bamidele Aniyikaiye
DATE: 9-11-15



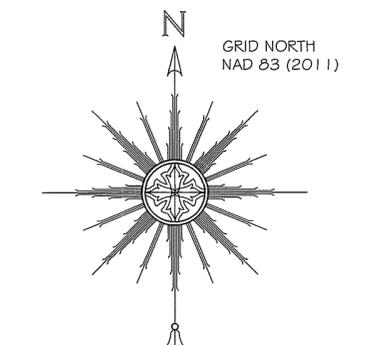
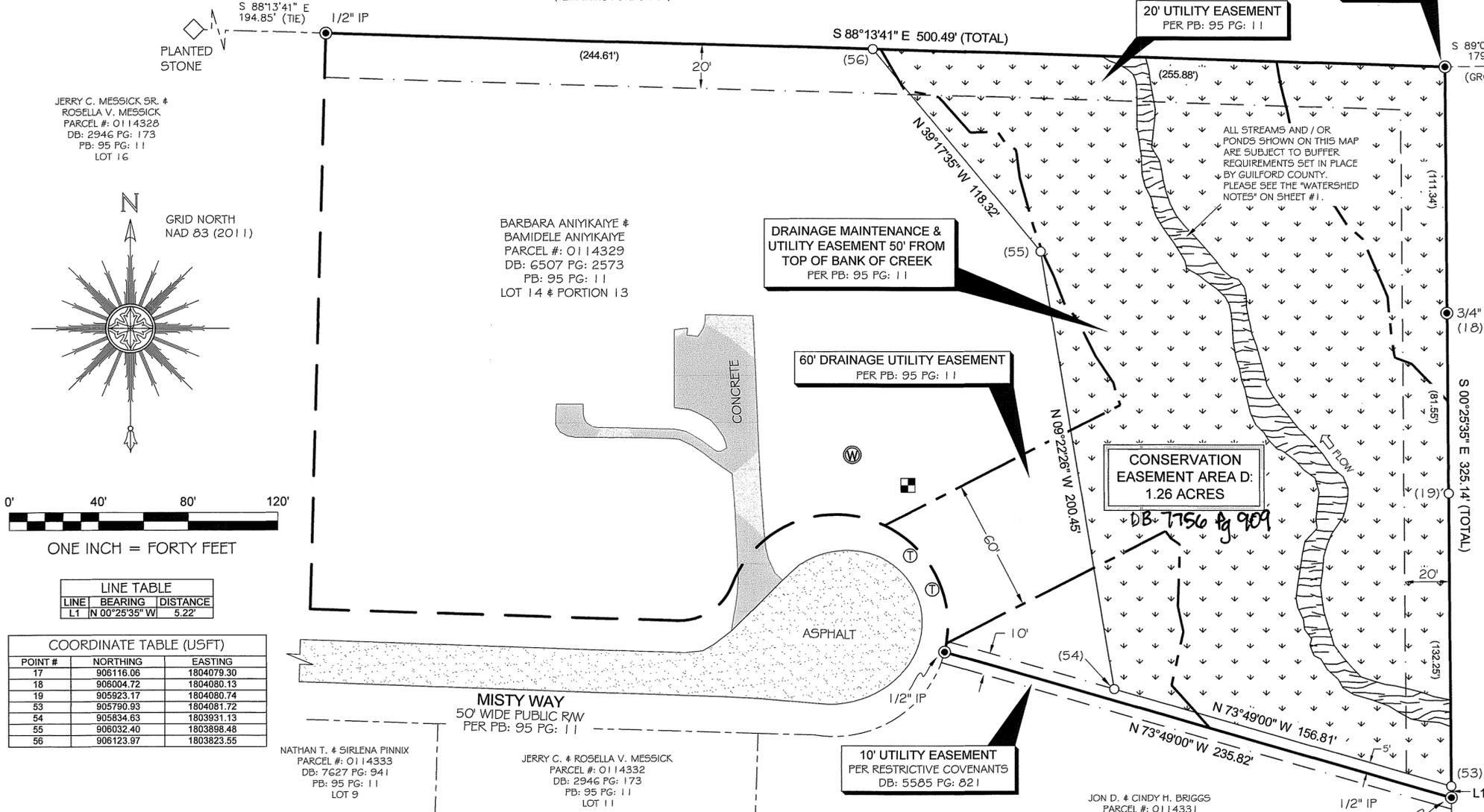
CONSERVATION EASEMENT CORNER CAP (TYPICAL)



BK: P 190
PG: 54-66
RECORDED: 201509088
GUILFORD COUNTY, NC
JEFF L THOMPEN
REGISTER OF DEEDS
DEPUTY-GB

JEFFERSON T. HOPKINS & WIFE MARY ANN HOPKINS
PARCEL #: 0114300
DB: 4057 PG: 1613
(REMAINING PORTION OF)

POB 3/4" IP
(CC) (17)
N: 906116.06
E: 1804079.30



LINE TABLE with columns for LINE, BEARING, and DISTANCE.

COORDINATE TABLE (USFT) with columns for POINT #, NORTHING, and EASTING.

LEGEND: Symbols and descriptions for boundary lines, easements, streams, and other features.

GRID TIE INFORMATION: GPS 1 and GPS 2 coordinates and control corner data.

- SURVEYOR'S NOTES: 10 numbered notes detailing survey methods, easement details, and property information.

EXCLUSION MAP, A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES, 'CANDY CREEK STREAM MITIGATION SITE'.

BK: R 7756
PG: 720-732
RECORDED:
11-03-2015
11:00:51 AM
BY: MEREDITH AAPPLE
DEPUTY-GB



2015059075

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$14.00

Excise Tax: \$14.00

STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

132

P/U ISAACSON

GUILFORD COUNTY

SPO File Number: 41-AAAE

DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Nancy Bray, (“**Grantor**”), whose mailing address is PO Box 14232, Greensboro, NC 27415, to the State of North Carolina, (“**Grantee**”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 8.56 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 4552 at Page 2029** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Area U containing a total of 0.63 **acres** as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Nancy Bray," dated Sept. 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Nancy Bray (SEAL)
Nancy Bray

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Nancy Bray, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27TH day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

Nancy Bray

SPO FILE NUMBER: 41-AAAE DMS SITE ID: 96315

The following conservation easement area is located off of NC HWY 150 within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Nancy Bray through Deed Book 4552 Page 2029 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "U":

BEGINNING AT A 1" IRON PIPE (CORNER 154), said rebar being at a common corner of Deed Book 4552 Page 2029, Deed Book 1826 Page 75 and Deed Book 3222 Page 644 of the Guilford County Registry, and located S 03°48'53" W a horizontal ground distance of 5141.92 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet;

Thence with the common line with Deed Book 4552 Page 2029 and Deed Book 322 Page 644 and the conservation easement area S 00°57'45" W 166.05 feet to an existing 1/2" iron pipe (CORNER 155); said iron pipe being the common corner of Deed Book 4552 Page 2029, Deed Book 4448 Page 36 and Deed Book 3222 Page 644 of the Guilford County Registry;

Thence with the common line of Deed Book 4552 Page 2029 and Deed Book 4448 Page 36 of the Guilford County Registry and continuing with the conservation easement area N 89°02'41" W a distance of 118.64 feet to a 5/8" rebar set with a CE cap (CORNER 156); said rebar being located S 89°02'41" E a distance of 111.08 feet from an existing 1/2" iron pipe at a common corner in the aforesaid common line;

Thence leaving the aforementioned common line and continuing with the conservation easement area N 24°14'33" W a distance of 195.24 feet to a 5/8" rebar set with a CE cap (CORNER 157); said rebar being located in the common line with Deed Book 4552 Page 2029 and Deed Book 1826 Page 75 of the Guilford County Registry, and located S 86°01'57" E a distance of 236.66 feet from an existing 3/4" iron pipe in the aforesaid common line;

Thence with the aforementioned common line and continuing with the conservation easement area S 86°01'57" E a distance of 202.07 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.63 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Nancy Bray; Job# 140431-

CE; sheet 13. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 4552, PG: 2029, AND PB: 168, PG: 103; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEOID: 12A
AVERAGE COMBINED FACTOR: .99998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCRC, NCGS
WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

DAVID GORDON WAGONER, SR.
PARCEL #: 0113961
ESTATE FILE: 09-E-1998
REF: DB: 3222 PG: 646

SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
- 2. AREAS CALCULATED BY THE COORDINATE METHOD.
- 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
- 4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
- 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
- 6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES. THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
- 7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 371089000J DATED 07/03/2007.
- 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
- 9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.
- 10. ALL STRUCTURES NOT LOCATED WITHIN 100 FEET OF THE CONSERVATION EASEMENT AREA SHOWN ON THIS MAP, HAVE BEEN REMOVED PER GUILFORD COUNTY PLANNING DEPARTMENT REQUIREMENTS.

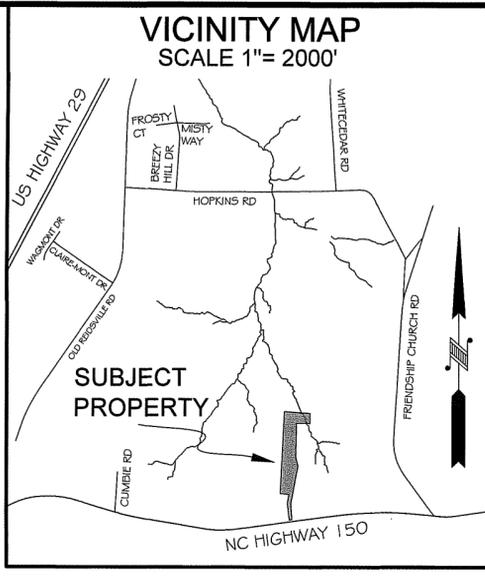
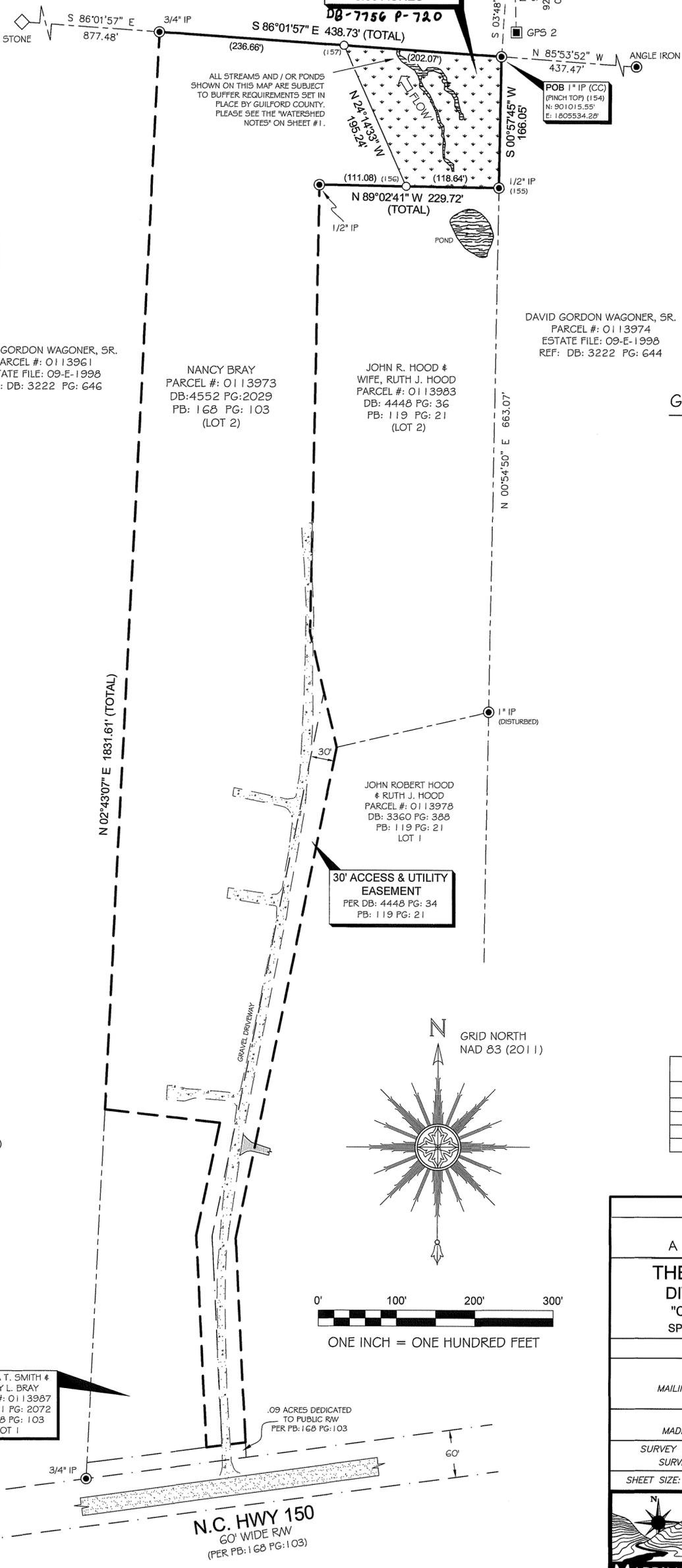
LEGEND:

- BOUNDARY LINE
- BOUNDARY LINE (NOT SURVEYED)
- TIE LINE ONLY
- ADJOINING DEED LINES
- FENCE LINE
- RIGHT OF WAY (R/W)
- CONSERVATION EASEMENT AREA
- ASPHALT
- STREAM/POND
- CALCULATED POINT
- 5/8" RBR SET W/ CE CAP
- EXISTING IRON PIN OR REBAR (AS NOTED)
- 1" IP SET W/ "KEE" CAP
- STONE
- 1" IP SET W/ "KEE" CONTROL CAP (CC)
- NOT TO SCALE (NTS)
- PB: PLAT BOOK
- DB: DEED BOOK
- PG: PAGE
- RBR: REBAR
- IP: IRON PIPE
- IPC: IRON PIPE W/ ID CAP
- NAVD: NORTH AMERICAN VERTICAL DATUM
- NAD: NORTH AMERICAN DATUM 1983
- SPC: STATE PLANE COORDINATES
- CC: CONTROL CORNER
- CE: CONSERVATION EASEMENT
- CF: COMBINED FACTOR
- POB: POINT OF BEGINNING



BRYAN DAVID HOPKINS
PARCEL #: 0112713
ESTATE FILE: 13-E-2589
REF: DB: 1826 PG: 75
(REMAINING PORTION OF)

CONSERVATION EASEMENT AREA U:
0.63 ACRES
DB-7756 P-720



GRID TIE INFORMATION

GPS 1	GPS 2
1" IPC "KEE" (CC)	1" IPC "KEE" (CC)
NC STATE PLANE COORDINATES	NC STATE PLANE COORDINATES
EPOCH: 2010 GEOID: 12A	EPOCH: 2010 GEOID: 12A
NAD 83(2011)	NAD 83(2011)
N: 906146.07	N: 905220.04
E: 1805876.38	E: 1805909.42
Z: 778.1' (NAVD88)	Z: 785.9' (NAVD88)
CF: 0.99998833	CF: 0.99998361

DAVID GORDON WAGONER, SR.
PARCEL #: 0113974
ESTATE FILE: 09-E-1998
REF: DB: 3222 PG: 644

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF SEP 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love
REVIEW OFFICER
9-17-15

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Nancy Bray
ATTESTED BY:
9-11-15

BK: P 190
PG: 54-66
RECORDED: 11-03-2015
10:23:40 AM
BY: MEREDITH AAPPLE DEPUTY-GS

COORDINATE TABLE (USFT)

POINT #	NORTHING	EASTING
154	901015.55	1805534.28
155	900849.53	1805531.49
156	900851.50	1805412.87
157	901029.53	1805332.70

EXCLUSION MAP

A FINAL PLAT OF
A CONSERVATION EASEMENT SURVEY FOR

THE STATE OF NORTH CAROLINA,
DIVISION OF MITIGATION SERVICES
"CANDY CREEK STREAM MITIGATION SITE"
SPO FILE NUMBER: 41-AAEE DMS SITE ID: 96315

PARCEL NUMBER: 0113973

CURRENT OWNER(S) LISTED AS:
NANCY BRAY
MAILING ADDRESS: P.O. BOX 14323, GREENSBORO, NC 27415
PHONE NUMBER(S): (336)-656-4919

DEED REFERENCE: BOOK: 4552 PAGE: 2029
MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA

SURVEY BY: DD, KP, NC DRAWN BY: NH CHECKED BY: PBK
SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE

SHEET SIZE: 18"x24" SHEET #: 13 OF 13 SCALE: 1"=100'

Kee
MAPPING & SURVEYING
P.O. Box 2566
Asheville, NC 28802
(828) 575-9021
www.keemap.com
License # C-3039

CASE NUMBER: 15-07-GCPL-03496

BK: R 7756
PG: 816-830
RECORDED:
11-03-2015
11:21:04 AM
BY: MEREDITH A APPLE
DEPUTY:GB



2015059089

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$130.00

Excise Tax: \$130.00

STATE OF NORTH CAROLINA

P/u Isaacson

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

15^m

GUILFORD COUNTY

SPO File Number: 41-AAAEF

DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Darin W. Carr and Wife Tamela P. Carr, (“**Grantor**”), whose mailing address is 7543 Friendship Church Rd, Browns Summit, NC 27214, to the State of North Carolina, (“**Grantee**”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 33.26 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 7310 at Page 3064** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas N, O, and P containing 0.69, 4.31, and 1.96 acres respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Darin W. Carr and Wife, Tamela P. Carr," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

The Grantor reserves the right, for himself, his successors and assigns, to operate motorized vehicles within Crossing Area(s) described on the survey recorded in Plat Book 190, Page 54-66, of the Guilford County Registry as "reserved stream crossing". Said crossing shall not exceed 25 feet in width, and must be maintained and repaired by Grantor, his successors or assigns to prevent degradation of the Conservation Easement Area.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the

Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center

Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Darin W. Carr (SEAL)
Darin W. Carr

Tamela P. Carr (SEAL)
Tamela P. Carr

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Darin W. Carr and Tamela P. Carr, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27th day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

**Darin W. Carr and wife, Tamela P. Carr
SPO FILE NUMBER: 41-AAAEF DMS SITE ID: 96315**

The following conservation easement area is located off of Friendship Church Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Darin W. Carr and wife, Tamela P. Carr through Deed Book 7310 Page 3064 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "P":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 133), said rebar being in a common line with Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 of the Guilford County Registry, and located S 10°43'11" W a horizontal ground distance of 3748.29 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; said rebar also being located N 86°42'32" W a distance of 858.79 feet from an existing 1/2" iron pipe in the aforesaid common line;

Thence leaving the aforementioned common line and with the conservation easement area the following (9) courses and distances:

- (1) S 15°14'21" E a distance of 25.50 feet to a 5/8" rebar set with a CE cap (CORNER 134);
- (2) S 76°09'38" E a distance of 291.83 feet to a 5/8" rebar set with a CE cap (CORNER 135);
- (3) S 37°44'09" E a distance of 232.80 feet to a 5/8" rebar set with a CE cap (CORNER 136);
- (4) S 32°40'25" W a distance of 133.61 feet to a 5/8" rebar set with a CE cap (CORNER 137);
- (5) N 50°52'43" W a distance of 95.60 feet to a 5/8" rebar set with a CE cap (CORNER 138);
- (6) N 30°32'19" W a distance of 141.68 feet to a 5/8" rebar set with a CE cap (CORNER 139);
- (7) N 83°31'34" W a distance of 205.17 feet to a 5/8" rebar set with a CE cap (CORNER 140);
- (8) N 60°32'53" W a distance of 95.85 feet to a 5/8" rebar set with a CE cap (CORNER 141);
- (9) N 24°56'54" W a distance of 161.57 feet to a 5/8" rebar set with a CE cap (CORNER 142);
said rebar being located in a common line with Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 of the Guilford County Registry; said rebar also being located S 86°42'32" E a distance of 235.15 feet from a 5/8" rebar set with a CE cap (CORNER 146);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°42'32" E a distance of 141.45 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.96 Acres, being the same more or less.

Conservation Easement Area "O":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 146), said rebar being in a common line of Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 of the Guilford County Registry, and located N 86°42'32" W a distance of 235.15 feet from a 5/8" rebar set with a CE cap (CORNER 142);

Thence leaving the aforesaid common line and with the conservation easement area S 07°40'26" E the following (3) distances:

- (1) 257.30 feet to a 5/8" rebar set with a CE cap (CORNER 147); said rebar being the northeast corner of a 25 foot wide reserved stream crossing;
- (2) 28.18 feet to a 5/8" rebar set with a CE cap (CORNER 148); said rebar being the southeast corner of a 25 foot wide reserved stream crossing;
- (3) 23.29 feet to a 5/8" rebar set with a CE cap (CORNER 149);

Thence continuing with the conservation easement area S 29°03'59" E a distance of 414.14 feet to a 5/8" rebar set with a CE cap (CORNER 150); said rebar being in a common line with Deed Book 7310 Page 3064 and Deed Book 1826 Page 75 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°07'36" W a distance of 200.80 feet to a 5/8" rebar set with a CE cap (CORNER 163); said rebar being located S 86°07'36" E a distance of 325.25 feet from a 5/8" rebar set with a CE cap (CORNER 168);

Thence leaving the aforementioned common line and continuing with the conservation easement area N 26°25'03" W the following (2) distances:

- (1) 309.65 feet to a 5/8" rebar set with a CE cap (CORNER 164); said rebar being the southwest corner of a 25 foot wide reserved stream crossing;
- (2) 25.29 feet to a 5/8" rebar set with a CE cap (CORNER 165); said rebar being a mutual corner of two 25 foot wide reserved stream crossings;

Thence continuing with the conservation easement area S 39°32'09" W the following (2) distances:

- (1) 25.07 feet to a 5/8" rebar set with a CE cap (CORNER 166); said rebar also being the southeast corner of a 25 foot wide reserved stream crossing;
- (2) 174.72 feet to a 5/8" rebar set with a CE cap (CORNER 167);

Thence continuing with the conservation easement area S 21°18'00" W a distance of 133.00 feet to a 5/8" rebar set with a CE cap (CORNER 168); said rebar being located in a common line with Deed Book 7310 Page 3064 and Deed Book 1826 Page 75 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°07'36" W a distance of 221.37 feet to a 5/8" rebar set with a CE cap (CORNER 188); said rebar being located S 86°07'36" E a distance of 25.73 feet from an existing 3/4" iron pipe; said iron pipe being at a common corner of Deed Book 7310 Page 3064 and Deed Book 1826 Page 75 and in a common line with Deed Book 6060 Page 322 of the Guilford County Registry;

Thence leaving the aforementioned common line and continuing with the conservation easement area N 37°18'41" E the following (3) distances:

- (1) 419.21 feet to a 5/8" rebar set with a CE cap (CORNER 189); said rebar being the westernmost corner of a 25 foot wide reserved stream crossing;
- (2) 25.01 feet to a 5/8" rebar set with a CE cap (CORNER 190); said rebar being the northwest corner of a 25 foot wide reserved stream crossing;
- (3) 187.93 feet to a 5/8" rebar set with a CE cap (CORNER 191);

Thence continuing with the conservation easement area N 25°49'14" W a distance of 138.98 feet to a 5/8" rebar set with a CE cap (CORNER 192); said rebar being located in the common line with Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 of the Guilford County Registry; said rebar also being located S 86°42'32" E a distance of 206.56 feet from a 5/8" rebar set with a CE cap (CORNER 194);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°42'32" E a distance of 180.93 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 4.31 Acres, being the same more or less.

Conservation Easement Area "N":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 194); said rebar being located in the common line with Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 of the Guilford County Registry; said rebar also being located N 86°42'32" W a distance of 206.56 feet from a 5/8" rebar set with a CE cap (CORNER 192);

Thence leaving the aforesaid common line and with the conservation easement area the following (2) courses and distances:

- (1) S 76°09'09" W a distance of 292.57 feet to a 5/8" rebar set with a CE cap (CORNER 195);
- (2) N 74°59'50" W a distance of 424.74 feet to an existing pinch top iron pipe (CORNER 196); said iron pipe being located at a common corner of Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 and in a common line with Deed Book 3554 Page 1365 of the Guilford County Registry, and located N 03°45'50" E 415.97 feet from an existing 3/4" iron rod; said iron rod being at a common corner of Deed Book 7310 Page 3064, Deed Book 7217 Page 2553, Deed Book 2388 Page 671 and Deed Book 3554 Page 1365 of the Guilford County Registry;

Thence with a common line of Deed Book 7310 Page 3064 and Deed Book 3502 Page 1633 and continuing with the conservation easement area S 86°42'32" E a distance of 695.48 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.69 Acres, being the same more or less.

Being all of that area of land containing a total of 6.96 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Darin W. Carr and Wife, Tamela P. Carr; Job# 140431-CE sheet 10. This description was prepared from an actual survey and

shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

GUILFORD COUNTY, NORTH CAROLINA

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 7310 PG: 3064; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEIOD: 12A
AVERAGE COMBINED FACTOR: .99998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCRE, NCOS

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.

THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647



THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul Love 9-16-15
PLANNING DIRECTOR DATE

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love 9-16-15
PLANNING DIRECTOR DATE

Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

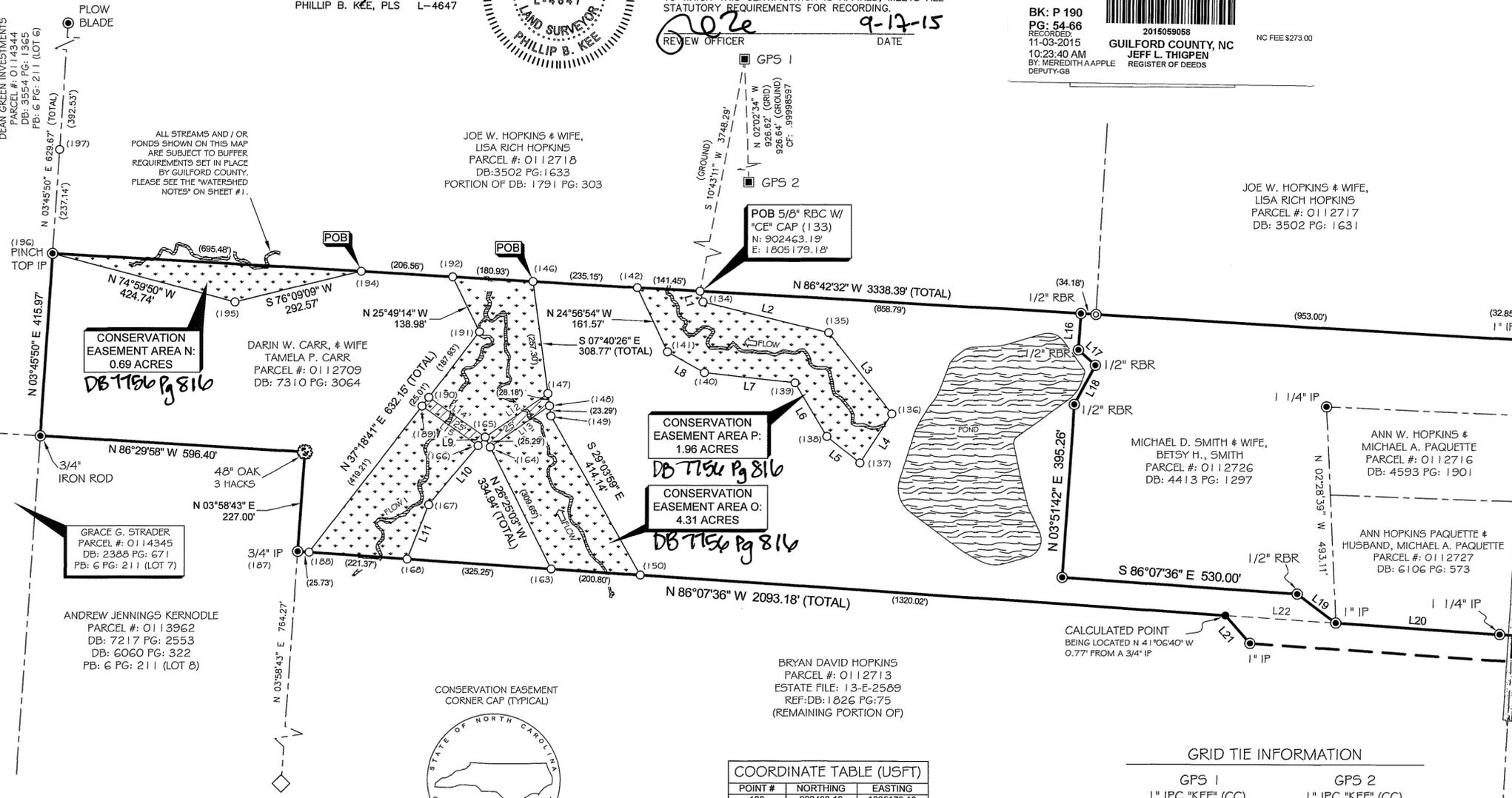
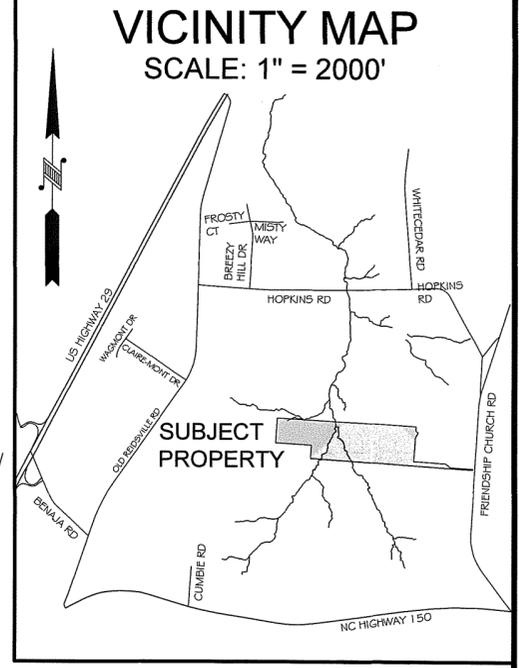
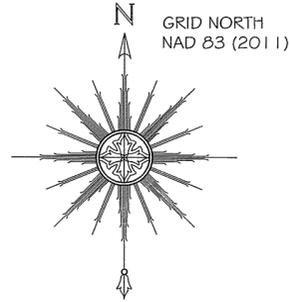
Paul Love 9-17-15
REVIEW OFFICER DATE

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Darin W. Carr 9/11/15
DARIN W. CARR DATE
TAMELA P. CARR 9-11-2015
TAMELA P. CARR DATE
Attested by: Kelly W. Boyx 9-11-2015
NAME DATE

BK: P 190
PG: 54-66
RECORDED: 11-03-2015
2015059058
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS
NC FEE \$273.00



- SURVEYOR'S NOTES:
1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.

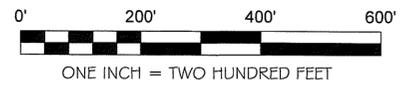
- LEGEND:
BOUNDARY LINE
BOUNDARY LINE (NOT SURVEYED)
TIE LINE ONLY
ADJOINING DEED LINES
FENCE LINE
CONSERVATION EASEMENT AREA
ASPHALT
STREAM
RESERVED STREAM CROSSING
CALCULATED POINT
5/8" RBR SET W/ CE CAP
EXISTING IRON PIN OR REBAR (AS NOTED)
TREE (AS NOTED)
STONE
1" IRON PIPE W/ "KEE" CAP (CC)
NOT TO SCALE (NTS)
PLAT BOOK
DEED BOOK
PAGE
REBAR
IRON PIPE
IRON PIPE W/ ID CAP
NORTH AMERICAN VERTICAL DATUM
NORTH AMERICAN DATUM 1983
STATE PLANE COORDINATES
CONTROL CORNER
CONSERVATION EASEMENT
COMBINED FACTOR
POINT OF BEGINNING

COORDINATE TABLE (USFT) with columns for POINT #, NORTHING, and EASTING. Points range from 133 to 196.

LINE TABLE with columns for LINE, BEARING, and DISTANCE. Lines range from L1 to L22.

GRID TIE INFORMATION table showing GPS 1 and GPS 2 coordinates in both 1" IPC 'KEE' (CC) and NC STATE PLANE COORDINATES.

TOTAL CONSERVATION EASEMENT AREA: 6.96 ACRES
AREA N: 0.69 ACRES
AREA O: 4.31 ACRES
AREA P: 1.96 ACRES



EXCLUSION MAP
A FINAL PLAT OF
A CONSERVATION EASEMENT SURVEY FOR
THE STATE OF NORTH CAROLINA,
DIVISION OF MITIGATION SERVICES
"CANDY CREEK STREAM MITIGATION SITE"
SPO FILE NUMBER: 41-AAAEF DMS SITE ID: 96315
PARCEL NUMBER: 0112709
CURRENT OWNER(S) LISTED AS:
DARIN W. CARR & WIFE, TAMELA P. CARR
MAILING ADDRESS: 7543 FRIENDSHIP CHURCH RD BROWNS SUMMIT, NC 27214
PHONE NUMBER(S): (336) 404-0741
DEED REFERENCE: BOOK: 7310 PAGE: 3064
MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA
SURVEY BY: DD,KP,NC DRAWN BY: EC CHECKED BY: PBK
SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE
SHEET SIZE: 18"x24" SHEET #: 10 OF 13 SCALE: 1"=200'

Logo for Kee Mapping & Surveying, P.O. Box 2566, Asheville, NC 28802, (828) 575-9021, www.keemap.com, License # C-3039

BK: R 7756
PG: 753-764
RECORDED:
11-03-2015
11:09:05 AM
BY: MEREDITH A APPLE
DEPUTY-GD



2015059080

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$16.00

Excise Tax: \$16.00

STATE OF NORTH CAROLINA

12^m

P/u Isaacson

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

GUILFORD COUNTY

SPO File Number: 41-AAAEG

DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Bruce H. Chrismon and Margie Long Chrismon, (“Grantor”), whose mailing address is 5245 Hopkins Road, Browns Summit, NC 27214, to the State of North Carolina, (“Grantee”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring,

maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 2.53 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 6156 at Page 1053** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Area F containing a total of 0.71 **acres** as shown on the plats of survey entitled "Final Plat, Conservation Easement for the State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed as: Bruce H. Chrismon and Margie Long Chrismon," dated Sept. 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Bruce H. Chrismon (SEAL)
Bruce H. Chrismon

Margie Long Chrismon (SEAL)
Margie Long Chrismon

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Bruce H. Chrismon and Margie Long Chrismon, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27th day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

11/29/18



Exhibit A

[SEE ATTACHED PAGE]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

**Bruce H. Chrismon & Margie Long Chrismon
SPO FILE NUMBER: 41-AAAG DMS SITE ID: 96315**

The following conservation easement area is located off of Hopkins Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Bruce H. Chrismon and Margie Long Chrismon through Deed Book 6156 Page 1053 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "F":

BEGINNING AT AN EXISTING 3/4" IRON PIPE (CORNER 44); said iron pipe being at a common corner of Deed Book 6156 Page 1053 and the remaining portion of Deed Book 188 Page 532 of the Guilford County Registry, and said iron pipe being located S 47°34'01" W a horizontal ground distance of 1416.82 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet;

Thence with a common line of Deed Book 6156 Page 1053 and the remaining portion of Deed book 188 Page 532 of the Guilford County Registry and with the conservation easement area S 00°29'01" E a distance of 450.18 feet to an existing 1/2" iron pipe (CORNER 41); said iron pipe being in the northern margin of a 60 foot wide right of way for Hopkins Road;

Thence leaving the aforementioned common line and with the northern margin of theaforesaid right of way and continuing with the conservation easement area S 89°03'59" W a distance of 84.93 feet to a 5/8" rebar set with a CE cap (CORNER 42); said rebar being located N 89°03'59" E a distance of 160.06 feet from an existing 1/2" iron pipe; said iron pipe being a common corner of Deed Book 6156 Page 1053 and Deed Book 5891 Page 1013 of the Guilford County Registry;

Thence leaving the aforementioned right of way and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 01°09'37" E a distance of 323.10 feet to a 5/8" rebar set with a CE cap (CORNER 43);
- (2) N 30°07'27" E a distance of 148.59 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.71 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Bruce H. Chrismon and Margie Long Chrismon; Job# 140431-CE, sheet 5. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 6156 PG: 1053...

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS...

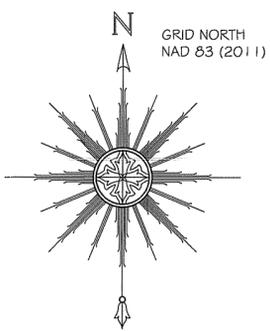
WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEIOD: 12A...

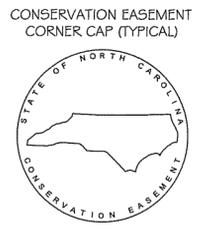
THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.



Phillip B. Kee PHILLIP B. KEE, PLS L-4647



ROBERT K. THACKER PARCEL #: 0114363 DB: 5891 PG: 1013



LEGEND:

- PB: PLAT BOOK DB: DEED BOOK PG: PAGE IP: IRON PIPE IPC: IRON PIPE W/ CAP R/W: RIGHT OF WAY N.A.D.: NORTH AMERICAN DATUM N.A.V.D.: NORTH AMERICAN VERTICAL DATUM SPC: STATE PLANE COORDINATES CF: COMBINED FACTOR CC: CONTROL CORNER CE: CONSERVATION EASEMENT POB: POINT OF BEGINNING O: 5/8" RBR W/ "CE" CAP Existing Iron Pin (As Noted) 1" Iron Pipe W/ "KEE" Cap (CC) Conservation Easement Area Concrete Asphalt Stream Boundary Line Tie Line Only Adjoining Deed Lines Right-of-Way

GUILFORD COUNTY, NORTH CAROLINA:

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

PLANNING DIRECTOR DATE Paul Lee 9-17-15 REVIEW OFFICER DATE

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

DAVID ELMO CHRISMON PARCEL #: 0112710 ESTATE FILE: 05-E-941 REF: DB: 188 PG: 532 (REMAINING PORTION OF)

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

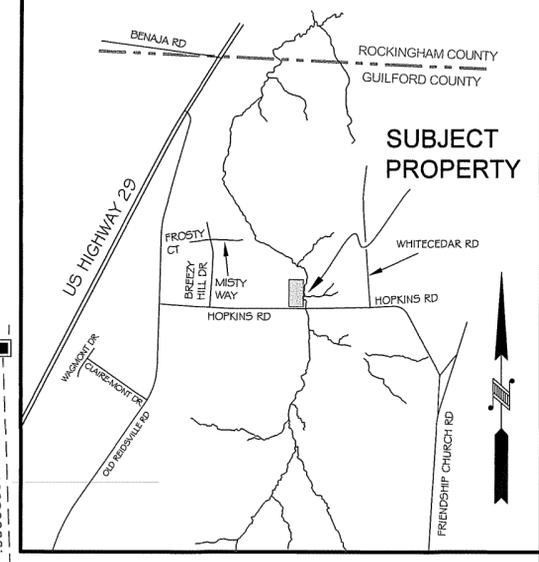
Bruce H. Chrison 9-11-15 DATE BRUCE H. CHRISON MARGIE LONG CHRISON 9-11-15 DATE

ATTESTED BY: 150 W Burg 9-11-15 DATE

BK: P 190 PG: 54-66 RECORDED: 11-03-2015 GUILFORD COUNTY, NC JEFF L. THIHPEN REGISTER OF DEEDS

POB 3/4" IP (44) N: 905190.10 E: 1804830.68

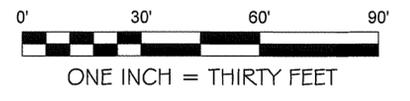
VICINITY MAP SCALE 1"=2000'



GRID TIE INFORMATION

Table with 2 columns: GPS 1 and GPS 2. Rows include 1" IPC "KEE" (CC) NC STATE PLANE COORDINATES, EPOCH: 2010, GEIOD: 12A, NAD 83(2011), N: 906146.07, E: 1805876.38, Z: 778.1 (NAVD88), CF: 0.99998833.

COORDINATE TABLE (USFT) with columns: POINT #, NORTHING, EASTING. Rows 41-44.



DAVID ELMO CHRISMON PARCEL #: 0112710 ESTATE FILE: 05-E-941 REF: DB: 188 PG: 532 (REMAINING PORTION OF)

SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007. 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.

CONSERVATION EASEMENT AREA F: 0.71 ACRES DB 7756-753

ALL STREAMS AND / OR PONDS SHOWN ON THIS MAP ARE SUBJECT TO BUFFER REQUIREMENTS SET IN PLACE BY GUILFORD COUNTY. PLEASE SEE THE "WATERSHED NOTES" ON SHEET #1.

EXCLUSION MAP A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAEG DMS SITE ID: 96315 PARCEL NUMBER: 0114364 CURRENT OWNER(S) LISTED AS: BRUCE H. CHRISMON & MARGIE LONG CHRISON OWNER MAILING ADDRESS: 5245 HOPKINS ROAD, BROWNS SUMMIT, NC 27214 PHONE NUMBER(S): (336) 656-9220 DEED REFERENCE: BOOK: 6156 PAGE: 1053 MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA SURVEY BY: DD, KP, NC DRAWN BY: NH CHECKED BY: NC SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE SHEET SIZE: 18"x24" SHEET #: 5 OF 13 SCALE: 1"=30'



P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

CASE NUMBER: 15-07-GCPL-03496

BK: R 7756
PG: 651-664
RECORDED:
11-03-2015
10:46:56 AM
BY: MEREDITH APPLE
DEPUTY-GB



2015059067

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$186.00

Excise Tax: \$186.00

STATE OF NORTH CAROLINA

P/u ISAACSON

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

GUILFORD COUNTY

14M

**SPO File Number: 41-AAAEH
DMS Project Number: 96315**

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by David Elmo Chrismon, ("**Grantor**"), whose mailing address is 8225 Whitecedar Road, Browns Summit, NC 27214, to the State of North Carolina, ("**Grantee**"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 92.83 acres and

being conveyed to the Grantor by deed as recorded in **Deed Book 188 at Page 532** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas G and H containing 7.05 and 1.37 acres respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed as: David Elmo Chrismon," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 190 Pages 54-66.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly

reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

The Grantor reserves the right, for himself, his successors and assigns, to operate motorized vehicles within Crossing Area(s) described on the survey recorded in Plat Book 190, Page 54-66, of the Guilford County Registry as "reserved stream crossing". Said crossing shall not exceed 25 feet in width, and must be maintained and repaired by Grantor, his successors or assigns to prevent degradation of the Conservation Easement Area.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

David Elmo Chrismon (SEAL)
David Elmo Chrismon

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that DAVID ELMO CHRISMON, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27TH day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

David Elmo Chrismon

SPO FILE NUMBER: 41-AAAEH DMS SITE ID: 96315

The following conservation easement area is located off of Hopkins Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to David Elmo Chrismon through Estate File 05-E-941 (Deed Book 188 Page 532) of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "G":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 26); said rebar being located S 82°26'33" W a horizontal ground distance of 401.48 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; and also being located S 30°49'23" E a distance of 320.68 feet from an existing 1/2" iron pipe; said iron pipe being in a common line with Deed Book 188 Page 532 and Deed Book 4057 Page 1613 of the Guilford County Registry;

Thence with the conservation easement area the following (14) courses and distances:

- (1) S 34°39'51" E a distance of 116.97 feet to a 5/8" rebar set with a CE cap (CORNER 27);
- (2) S 59°08'23" W a distance of 250.55 feet to a 5/8" rebar set with a CE cap (CORNER 28);
- (3) S 73°39'22" W a distance of 209.12 feet to a 5/8" rebar set with a CE cap (CORNER 29);
- (4) S 30°39'47" W a distance of 223.81 feet to a 5/8" rebar set with a CE cap (CORNER 30);
- (5) S 48°09'09" W a distance of 215.93 feet to a 5/8" rebar set with a CE cap (CORNER 31);
- (6) S 42°08'55" E a distance of 142.31 feet to a 5/8" rebar set with a CE cap (CORNER 32); said rebar being the northwest corner of a 25 foot wide reserved stream crossing;
- (7) S 42°08'55" E a distance of 10.97 feet to a 5/8" rebar set with a CE cap (CORNER 33);
- (8) N 52°16'40" E a distance of 69.51 feet to a 5/8" rebar set with a CE cap (CORNER 34); said rebar being the northeast corner of a 25 foot wide reserved stream crossing;
- (9) N 52°16'40" E a distance of 203.39 feet to a 5/8" rebar set with a CE cap (CORNER 35);
- (10) S 37°20'22" E a distance of 132.63 feet to a 5/8" rebar set with a CE cap (CORNER 36);
- (11) S 52°56'30" W a distance of 330.50 feet to a 5/8" rebar set with a CE cap (CORNER 37);
- (12) S 19°23'48" W a distance of 189.60 feet to a 5/8" rebar set with a CE cap (CORNER 38);
- (13) S 05°59'54" E a distance of 225.74 feet to a 5/8" rebar set with a CE cap (CORNER 39);
- (14) S 07°55'46" W a distance of 78.73 feet to a 5/8" rebar set with a CE cap (CORNER 40); said rebar being in the northern margin of the 60 foot wide right of way for Hopkins Road;

Thence with the northern margin of the aforesaid right of way and continuing with the conservation easement area S 89°41'02" W a distance of 104.89 feet to an existing 1/2" iron pipe (CORNER 41); said iron pipe being at a common corner of the remaining portion of Deed Book 188 Page 532 and Deed Book 6156 Page 1053 of the Guilford County Registry;

Thence leaving the northern margin of the aforementioned right of way and with the common line of the remaining portion of Deed Book 188 Page 532 and Deed book 6156 Page 1053 of the Guilford County Registry and continuing with the conservation easement area N 00°29'01" W a distance of 450.18 feet to an existing 3/4" iron pipe (CORNER 44); said iron pipe being the southernmost corner of the a 25 foot wide reserved stream crossing;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (4) courses and distances:

- (1) N 12°09'43" W a distance of 31.42 feet to a 5/8" rebar set with a CE cap (CORNER 45); said rebar being the westernmost corner of the a 25 foot wide reserved stream crossing;
- (2) N 12°09'43" W a distance of 101.30 feet to a 5/8" rebar set with a CE cap (CORNER 46);
- (3) N 75°15'36" W a distance of 161.09 feet to a 5/8" rebar set with a CE cap (CORNER 47);
- (4) N 34°49'25" W a distance of 110.86 feet to a 5/8" rebar set with a CE cap (CORNER 48); said rebar being in the common line of Deed Book 188 Page 532 and Deed Book 5891 Page 1013 of the Guilford County Registry, and located N 00°28'17" W a distance of 115.75 feet from and existing 1/2" iron pipe in the aforesaid common line;

Thence with the aforementioned common line and continuing with conservation easement area N 00°28'17" W the following (2) distances:

- (1) 133.85 feet to an existing 2" iron pipe;
- (2) 62.31 feet to a 5/8" rebar set with a CE cap (CORNER 21);

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (5) courses and distances:

- (1) S 61°14'05" E a distance of 166.08 feet to a 5/8" rebar set with a CE cap (CORNER 22);
- (2) N 48°58'59" E a distance of 267.94 feet to a 5/8" rebar set with a CE cap (CORNER 23);
- (3) N 35°41'19" E a distance of 241.59 feet to a 5/8" rebar set with a CE cap (CORNER 24);
- (4) N 73°52'19" E a distance of 205.10 feet to a 5/8" rebar set with a CE cap (CORNER 25);
- (5) N 65°27'49" E a distance of 231.58 feet to TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 7.05 Acres, being the same more or less.

Conservation Easement Area "H":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 78) in the southern margin of the 60 foot wide right of way for Hopkins Road (SR# 2700); said rebar being located S 37°06'02" E a distance of 74.92 feet from a 5/8" rebar set with a CE cap (CORNER 40); said rebar being located in the northern margin of the aforesaid right of way;

Thence with the conservation easement area the following (3) courses and distances:

- (1) S 14°04'57" E a distance of 212.43 feet to a 5/8" rebar set with a CE cap (CORNER 79);
- (2) S 09°54'18" W a distance of 99.21 feet to a 5/8" rebar set with a CE cap (CORNER 80);
- (3) S 51°28'08" E a distance of 58.53 feet to a 5/8" rebar set with a CE cap (CORNER 81); said rebar being in a common line with Deed Book 188 Page 532 and Deed Book 3557 Page 282 of the Guilford County Registry; said rebar also being located N 88°56'17" W a distance of 1699.05 feet from an existing 1/2" iron pipe in the aforesaid common line;

Thence with the aforementioned common line and continuing with the conservation easement area N 88°56'17" W a distance of 240.33 feet to a 5/8" rebar set with a CE cap (CORNER 122); said rebar being located S 88°56'17" E a distance of 213.71 feet from an existing 3/4" iron pipe; said iron pipe being at a common corner of Deed Book 188 Page 532, Deed Book 3557 Page 282, Deed Book 3654 Page 309 and Deed Book 4129 Page 1889 of the Guilford County Registry;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (2) courses and distances:

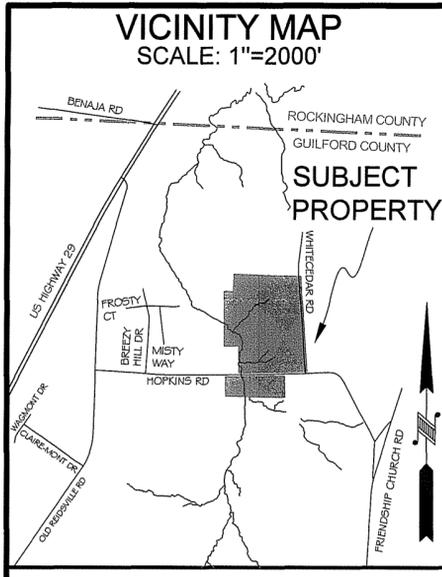
- (1) N 15°37'59" E a distance of 164.76 feet to a 5/8" rebar set with a CE cap (CORNER 123);
- (2) N 20°25'40" W a distance of 187.58 feet to a 5/8" rebar set with a CE cap (CORNER 124) in the southern margin of a 60 foot wide right of way for Hopkins Road; said rebar also being located S 27°01'37" W a distance of 67.93 feet from an existing 1/2" iron pipe (CORNER 41);

Thence with the southern margin of the 60 foot wide right of way and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 89°03'59" E a distance of 31.53 feet to a 5/8" rebar set with a CE cap (CORNER 125);
- (2) N 89°41'02" E a distance of 149.43 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.37 Acres, being the same more or less.

Being all of that area of land containing a total of 8.42 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of David Elmo Chrismon; Job# 140431-CE, sheet 6. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).



CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 188 PG: 532 THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXISTING TO THE DEFINITION OF SUBDIVISION.

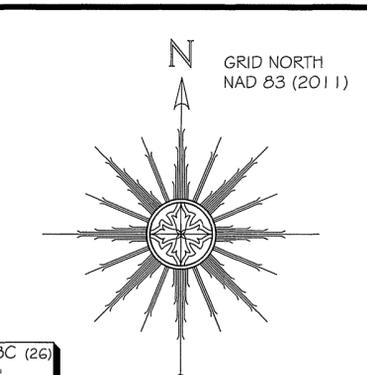
WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEOID: 12A
AVERAGE COMBINED FACTOR: .99998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCRE, NCGS

THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

SEAL
L-4647
NORTH CAROLINA PROFESSIONAL LAND SURVEYOR
PHILLIP B. KEE

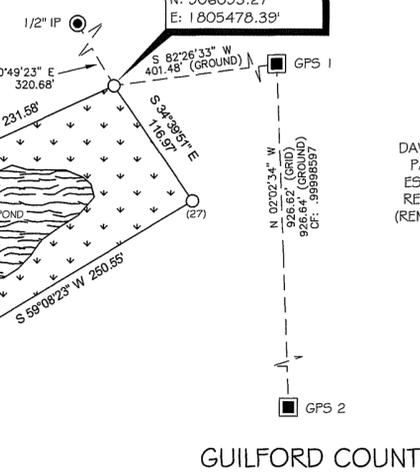
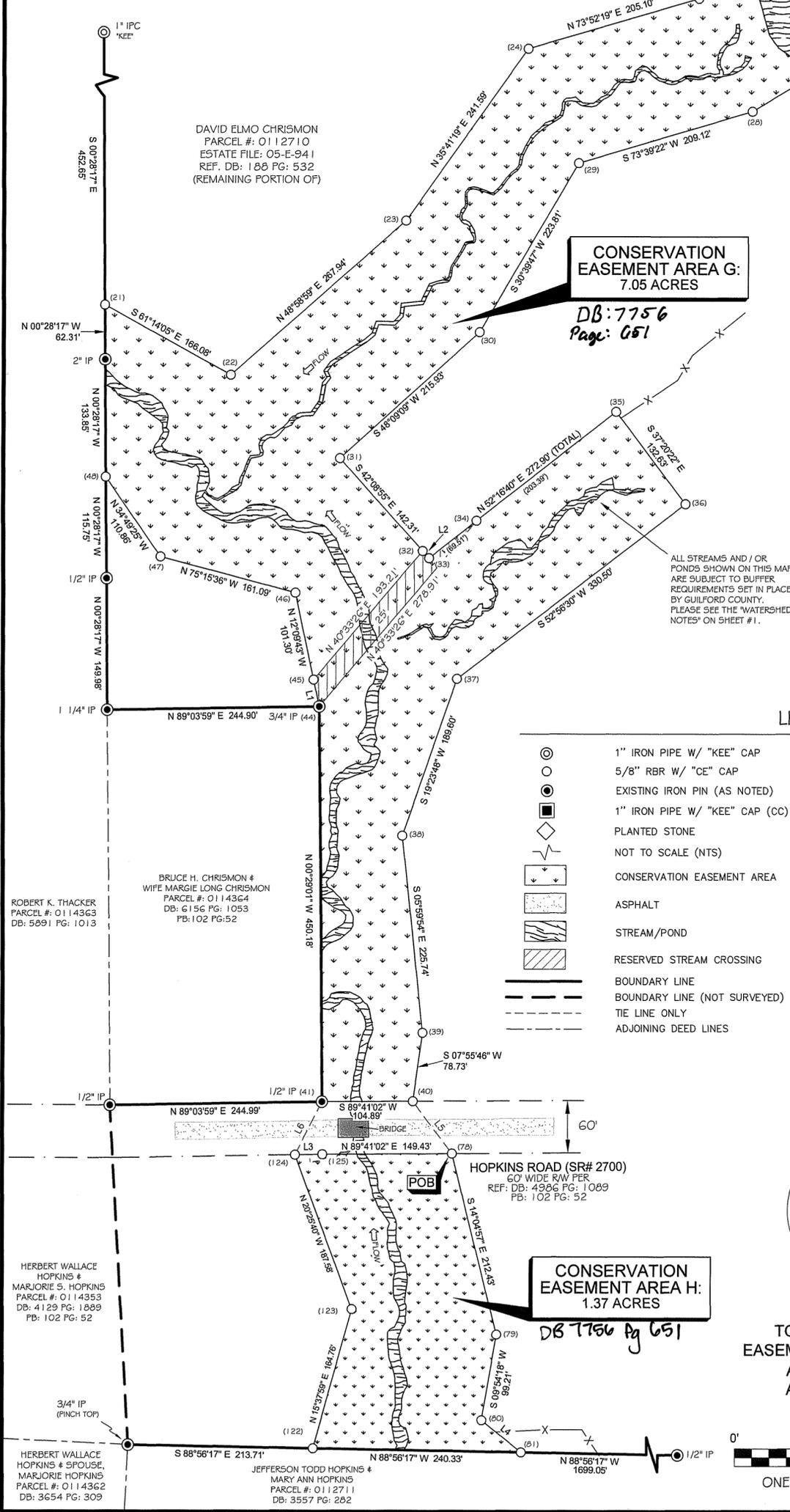


COORDINATE TABLE (USFT)

POINT #	NORTHING	EASTING
21	905647.99	1804582.01
22	905568.07	1804727.60
23	905743.91	1804929.76
24	905940.13	1805070.70
25	905997.10	1805267.73
26	906093.27	1805478.39
27	905997.06	1805544.92
28	905868.54	1805329.84
29	905809.70	1805129.18
30	905617.18	1805015.03
31	905473.12	1804854.18
32	905367.61	1804949.68
33	905359.48	1804957.04
34	905402.01	1805012.03
35	905526.45	1805172.91
36	905421.00	1805253.35
37	905221.83	1804989.61
38	905042.99	1804926.54
39	904818.49	1804850.23
40	904740.51	1804839.37
41	904739.93	1804834.48
45	905220.82	1804824.06
46	905319.85	1804802.72
47	905360.83	1804846.93
48	905451.83	1804853.63
78	904680.76	1804984.56
79	904474.71	1805036.25
80	904376.98	1805019.18
81	904340.52	1805064.96
122	904344.97	1804824.68
123	904503.84	1804869.08
124	904679.42	1804803.61

GRID TIE INFORMATION

GPS 1	GPS 2
1" IPC "KEE" (CC)	1" IPC "KEE" (CC)
NC STATE PLANE COORDINATES	NC STATE PLANE COORDINATES
EPOCH: 2010 GEOID: 12A	EPOCH: 2010 GEOID: 12A
NAD 83(2011)	NAD 83(2011)
N: 906146.07'	N: 905220.04'
E: 1805876.38'	E: 1805909.42'
Z: 778.1' (NAVD88)	Z: 785.9' (NAVD88)
CF: 0.999998633	CF: 0.999998361



GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September, 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

John P. Egan
PLANNING DIRECTOR DATE

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love
PLANNING DIRECTOR DATE

I, Paul Love, REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

Paul Love 9-17-15
REVIEW OFFICER DATE

DAVID ELMO CHRISMON
PARCEL #: 0112710
ESTATE FILE: 05-E-941
REF. DB: 188 PG: 532
(REMAINING PORTION OF)

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

David Elmo Chrismon 9-15-15
DAVID ELMO CHRISMON DATE

ATTESTED BY:
Phillip B. Kee 9-15-15
NAME DATE

BK: P 190
PG: 54-66
RECORDED: 11-03-2015
10:23:40 AM
BY: MEREDITH AAPPLE REGISTER OF DEEDS
DEPUTY-GS

2015089058
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS
NC FEE \$273.00

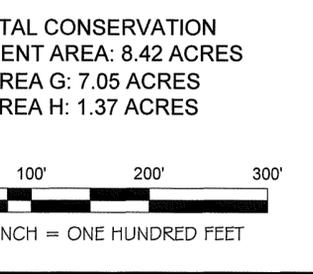
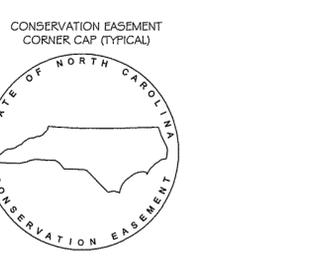
LINE TABLE

LINE	BEARING	DISTANCE
L1	N 12°09'43" W	31.42'
L2	S 42°08'55" E	10.97'
L3	N 89°03'59" E	31.53'
L4	S 51°28'08" E	58.53'
L5	S 37°06'02" E	74.92'
L6	S 27°01'37" W	67.93'

LEGEND:

⊙	1" IRON PIPE W/ "KEE" CAP	---	RIGHT OF WAY LINE
○	5/8" RBR W/ "CE" CAP	-X-	FENCE
●	EXISTING IRON PIN (AS NOTED)	PB:	PLAT BOOK
⊙	1" IRON PIPE W/ "KEE" CAP (CC)	DB:	DEED BOOK
◇	PLANTED STONE	PG:	PAGE
NTS	NOT TO SCALE (NTS)	IP	IRON PIPE
▭	CONSERVATION EASEMENT AREA	IPC	IRON PIPE W/ CAP
▭	ASPHALT	RBR	REBAR
▭	STREAM/POND	RBC	REBAR W/ ID CAP
▭	RESERVED STREAM CROSSING	R/W	RIGHT OF WAY
---	BOUNDARY LINE	N.A.D.	NORTH AMERICAN DATUM
---	BOUNDARY LINE (NOT SURVEYED)	N.A.V.D.	NORTH AMERICAN VERTICAL DATUM
---	TIE LINE ONLY	SPC	STATE PLANE COORDINATES
---	ADJOINING DEED LINES	CF	COMBINED FACTOR
		CC	CONTROL CORNER
		CE	CONSERVATION EASEMENT
		POB	POINT OF BEGINNING

- SURVEYOR'S NOTES:**
- ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
 - AREAS CALCULATED BY THE COORDINATE METHOD.
 - PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
 - GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
 - THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
 - UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES. THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
 - BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 371089000J DATED 07/03/2007.
 - THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
 - PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.



EXCLUSION MAP

A FINAL PLAT OF
A CONSERVATION EASEMENT SURVEY FOR

**THE STATE OF NORTH CAROLINA,
DIVISION OF MITIGATION SERVICES
"CANDY CREEK STREAM MITIGATION SITE"**

SPO FILE NUMBER: 41-AAAEH DMS SITE ID: 96315

PARCEL NUMBER: 0112710

CURRENT OWNER(S) LISTED AS:
DAVID ELMO CHRISMON

MAILING ADDRESS: 8225 WHITECEDAR ROAD, BROWNS SUMMIT, NC 27214
PHONE NUMBER(S): (336) 656-9220

DEED REFERENCE: ESTATE FILE 05-E-941 (DEED BOOK: 188 PAGE: 532)
MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA

SURVEY BY: DD, KP, NC DRAWN BY: NH CHECKED BY: NC
SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE

SHEET SIZE: 18"x24" SHEET #: 6 OF 13 SCALE: 1"=100'

Kee
MAPPING & SURVEYING

P.O. Box 2566
Asheville, NC 28802
(828) 575-9021
www.keemap.com
License # C-3039

BK: R 7756
PG: 738-751
RECORDED:
11-03-2015
11:03:57 AM
BY: MEREDITH A APPLE
DEPUTY-GB



2015059078
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$83.00

Excise Tax: \$83.00

STATE OF NORTH CAROLINA

Hu Isaacson

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

14th

GUILFORD COUNTY

**SPO File Number:41-AAAEI
DMS Project Number: 96315**

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Herbert Wallace Hopkins and Spouse, Marjorie Hopkins, (“**Grantor**”), whose mailing address is 8066 Old Reidsville Road, Browns Summit, NC 27214, to the State of North Carolina, (“**Grantee**”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 48.5 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 3654 at Page 306** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas J, K, and L containing 1.14, 1.58, and 1.03 **acres** respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Herbert Wallace Hopkins and Spouse, Marjorie Hopkins," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Herbert Wallace Hopkins (SEAL)

Herbert Wallace Hopkins

Marjorie Hopkins (SEAL)

Marjorie Hopkins

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Herbert Wallace Hopkins and Marjorie Hopkins, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27th day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

Herbert Wallace Hopkins and Marjorie Hopkins
SPO FILE NUMBER: 41-AAAEI DMS SITE ID: 96315

The following conservation easement area is located off of Marcus Loop within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Herbert Wallace Hopkins and Marjorie Hopkins through Deed Book 3654 Page 306 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "J":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 94); said rebar being in the common line of Deed Book 3654 Page 306 and Deed Book 3557 Page 282 of the Guilford County Registry, and located S 03°23'56" E a horizontal ground distance of 2475.19 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; said rebar also being located N 86°45'42" W a distance of 1108.35 feet from an existing 1/2" iron pipe at a corner of the aforesaid common line;

Thence leaving the aforementioned common line and with the conservation easement area the following (6) courses and distances:

- (1) S 12°33'28" E a distance of 15.91 feet to a 5/8" rebar set with a CE cap (CORNER 95);
- (2) S 67°17'45" E a distance of 220.76 feet to a 5/8" rebar set with a CE cap (CORNER 96);
- (3) S 21°31'25" E a distance of 73.95 feet to a 5/8" rebar set with a CE cap (CORNER 97);
- (4) S 56°30'55" W a distance of 141.27 feet to a 5/8" rebar set with a CE cap (CORNER 98);
- (5) N 53°51'59" W a distance of 320.14 feet to a 5/8" rebar set with a CE cap (CORNER 99);
- (6) N 13°00'08" W a distance of 69.39 feet to a 5/8" rebar set with a CE cap (CORNER 100); said rebar being in the common line of Deed Book 3654 Page 306 and Deed Book 3557 Page 282 of the Guilford County Registry, and located S 86°45'42" E a distance of 856.81 feet from a 5/8" rebar set with a CE cap (CORNER 111);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°45'42" E a distance of 158.00 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.14 Acres, being the same more or less.

Conservation Easement Area "K":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 111); said rebar being in a common line of Deed Book 3654 Page 306 and Deed Book 3557 Page 282 of the Guilford County Registry, and located N 86°45'42" W a distance of 856.81 feet from a 5/8" rebar set with a CE cap (CORNER 100);

Thence leaving the aforementioned common line and with the conservation easement area the following (6) courses and distances:

- (1) S 09°16'02" W a distance of 112.74 feet to a 5/8" rebar set with a CE cap (CORNER 112);
- (2) S 16°31'20" W a distance of 209.31 feet to a 5/8" rebar set with a CE cap (CORNER 113);
- (3) S 49°30'57" W a distance of 78.32 feet to a 5/8" rebar set with a CE cap (CORNER 114); said rebar being located N 68°51'23" E a distance of 92.38 feet from a calculated point (CORNER 126);
- (4) N 70°38'28" W a distance of 202.06 feet to a 5/8" rebar set with a CE cap (CORNER 115); said rebar being located N 48°31'55" E a distance of 68.72 feet from a 5/8" rebar set with a CE cap (CORNER 203);
- (5) N 40°25'12" E a distance of 180.91 feet to calculated point in a creek bed (CORNER 116);
- (6) N 09°44'29" E a distance of 170.82 feet to a 5/8" rebar set with a CE cap (CORNER 117) in the common line with Deed Book 3654 Page 306 and Deed Book 3557 Page 282 of the Guilford County Registry, and located S 86°45'42" E a distance of 248.45 feet from an existing 3/4" iron pipe at a common corner in the aforesaid common line;

Thence with the aforementioned common line of and continuing with the conservation easement area S 86°45'42" E a distance of 181.97 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.58 Acres, being the same more or less.

Conservation Easement Area "L":

BEGINNING AT A CALCULATED POINT (CORNER 126); said calculated point being in a creek bed, and located S 68°51'23" W a distance of 92.38 feet from a 5/8" rebar set with a CE cap (CORNER 114);

Thence with the conservation easement area the following (2) courses and distances:

- (1) S 24°15'48" W a distance of 202.79 feet to a 5/8" rebar set with a CE cap (CORNER 127);
- (2) S 04°26'19" E a distance of 30.75 feet to a 5/8" rebar set with a CE cap (CORNER 128); said rebar being in the common line with Deed Book 3654 Page 306 and Deed Book 3502 Page 1633 of the Guilford County Registry, and located N 86°41'49" W a distance of 1411.79 feet from a 1" iron pipe set with a Kee cap in the aforesaid common line;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°41'49" W a distance of 162.63 feet to a 5/8" rebar set with a CE cap (CORNER 201); said rebar being located S 86°41'49" E a distance of 781.16 feet from an existing plow blade in the aforementioned common line;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (3) courses and distances:

- (1) N 05°52'24" E a distance of 191.15 feet to a 5/8" rebar set with a CE cap (CORNER 202);
- (2) N 43°45'05" E a distance of 98.03 feet to a 5/8" rebar set with a CE cap (CORNER 203); said rebar being located S 48°31'55" W a distance of 68.72 feet from a 5/8" rebar set with a CE cap (CORNER 115);
- (3) S 70°38'28" E a distance of 165.31 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 1.03 Acres, being the same more or less.

Being all of that area of land containing a total of 3.75 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Herbert Wallace Hopkins and Marjorie Hopkins; Job# 140431-CE, sheet 8. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

GUILFORD COUNTY, NORTH CAROLINA

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 3654 PG: 306 AND DB: XXX PG: XXX...

GPS METADATA

CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEOD: 12A...

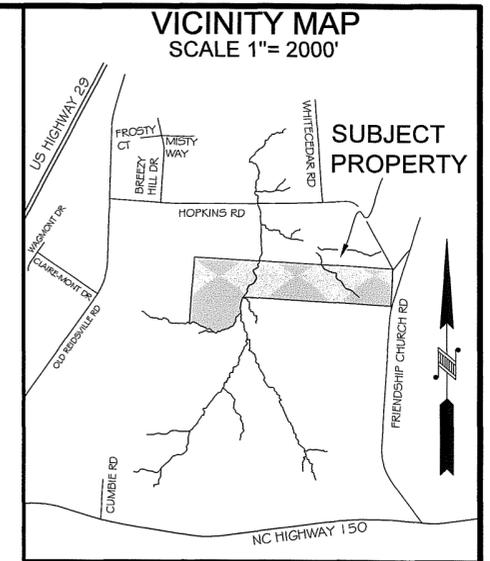
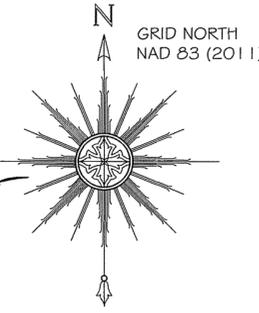
THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015. Paul R. Egan 9-16-15 PLANNING DIRECTOR DATE

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Herbert Wallace Hopkins 9-15-15 HERBERT WALLACE HOPKINS DATE
Marjorie Hopkins 9-15-15 MARJORIE HOPKINS DATE
Attested by: Paul R. Egan 9-15-15 NAME DATE



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee PHILLIP B. KEE, PLS L-4647



THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul R. Egan 9-16-15 PLANNING DIRECTOR DATE

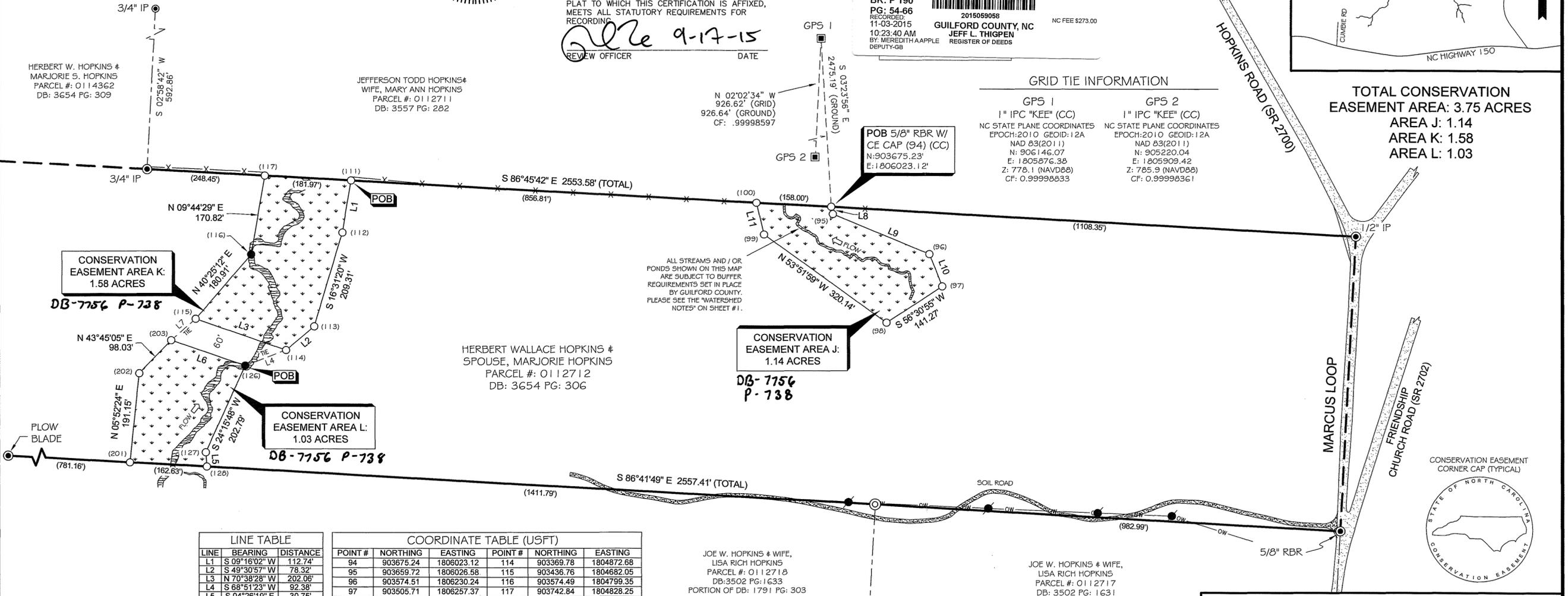
Paul Love 9-17-15 REVIEW OFFICER DATE

Barcode and recording information: BK: P 190 PG: 54-66 RECORDED: 11-03-2015 10:23:40 AM GUILFORD COUNTY, NC BY: MEREDITH AAPPLE DEPUTY-GB

GRID TIE INFORMATION

Table with 2 columns: GPS 1 and GPS 2. Rows include coordinates (NAD 83, NAD 83(2011)), bearings, distances, and combined factors.

TOTAL CONSERVATION EASEMENT AREA: 3.75 ACRES AREA J: 1.14 AREA K: 1.58 AREA L: 1.03



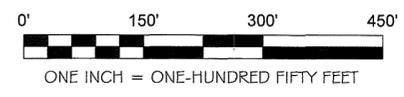
CONSERVATION EASEMENT AREA K: 1.58 ACRES DB-7756 P-738

CONSERVATION EASEMENT AREA J: 1.14 ACRES DB-7756 P-738

CONSERVATION EASEMENT AREA L: 1.03 ACRES DB-7756 P-738

LINE TABLE with columns: LINE, BEARING, DISTANCE. Lists lines L1 through L11.

COORDINATE TABLE (USFT) with columns: POINT #, NORTHING, EASTING. Lists points 94 through 113.



ONE INCH = ONE-HUNDRED FIFTY FEET

SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.

- BOUNDARY LINE
BOUNDARY LINE (NOT SURVEYED)
TIE LINE ONLY
ADJOINING DEED LINES
FENCE LINE
CONSERVATION EASEMENT AREA
ASPHALT
STREAM
CALCULATED POINT
5/8" RBR SET W/ CE CAP
EXISTING IRON PIN OR REBAR (AS NOTED)
STONE
1" IP SET W/ "KEE" CAP

EXCLUSION MAP
A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAEI DMS SITE ID: 96315

Keemapping & Surveying logo and contact information: P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

BK: R 7756
PG: 855-870
RECORDED:
11-03-2015
11:28:55 AM
BY: MEREDITH AAPPLE
DEPUTY-GB



2015059095

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$30.00
STATE OF NC
REAL ESTATE
EXTX \$125.00

Excise Tax: \$125.00

STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

P/u Isaacson

16^m

GUILFORD COUNTY

**SPO File Number: 41-AAAEJ
DMS Project Number: 96315**

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Bryan David Hopkins and Peggy G. Hopkins, ("**Grantor**"), whose mailing address is 7541 Friendship Church Rd, Browns Summit, NC 27214, to the State of North Carolina, ("**Grantee**"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 45.61 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 1826 at Page 75** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

- Conservation Easement Areas Q and R containing 3.02 and 3.61 **acres** respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Bryan David Hopkins," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

The Grantor reserves the right, for himself, his successors and assigns, to operate motorized vehicles within Crossing Area(s) described on the survey recorded in Plat Book 190, Page 54-66, of the Guilford County Registry as "reserved stream crossing". Said crossing shall not exceed 25 feet in width, and must be maintained and repaired by Grantor, his successors or assigns to prevent degradation of the Conservation Easement Area.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the

Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center

Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Bryan David Hopkins (SEAL)
Bryan David Hopkins

Peggy G. Hopkins by Bryan David Hopkins attorney in fact
Peggy G. Hopkins

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Bryan David Hopkins, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27TH day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:

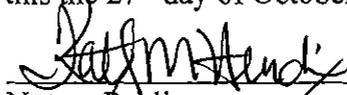
11/29/18



**STATE OF NORTH CAROLINA
COUNTY OF GUILFORD**

I, the undersigned, a Notary Public, do hereby certify that BRYAN DAVID HOPKINS, Attorney in Fact for PEGGY G. HOPKINS, personally appeared before me this day and being by me duly sworn says that he executed the foregoing and annexed instrument for and in behalf of PEGGY G. HOPKINS and that his authority to execute and acknowledge said instrument is contained in an instrument duly executed, acknowledged and recorded in the Office of the Register of Deeds of Guilford County, North Carolina in Book 7756 Page 853, and that this instrument was executed under and by virtue of the authority given by said instrument granting BRYAN DAVID HOPKINS power of attorney and that the said BRYAN DAVID HOPKINS acknowledged the due execution of the foregoing and annexed instrument for the purposes therein expressed for and in behalf of the said PEGGY G. HOPKINS.

WITNESS my hand and official seal this the 27th day of October, 2015.



Notary Public
My commission expires: 11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

Bryan David Hopkins

SPO FILE NUMBER: 41-AAAEJ DMS SITE ID: 96315

The following conservation easement area is located off of Friendship Church Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Bryan David Hopkins through Estate File: 13-E-2589 (Deed Book 1826 Page 75) of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "R":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 150), said rebar being in a common line with Deed Book 1826 Page 75 and Deed Book 7310 Page 3064 of the Guilford County Registry, and being located S 10°51'45" W a horizontal ground distance of 4408.24 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet;

Thence leaving the aforesaid common line and with the conservation easement area S 29°03'49" E the following (2) distances:

- (1) 212.82 feet to a 5/8" rebar set with a CE cap (CORNER 151);
- (2) 25.20 feet to a 5/8" rebar set with a CE cap (CORNER 152);

Thence continuing with the conservation easement area the following (2) courses and distances:

- (1) S 34°14'26" E a distance of 372.24 feet to a 5/8" rebar set with a CE cap (CORNER 153);
- (2) S 29°48'36" E a distance of 329.04 feet to a 1" pinch top iron pipe (CORNER 154); said iron pipe being in a common line with Deed Book 1826 Page 75 and at a common corner of Deed Book 4552 Page 2029 and Deed Book 3222 Page 644 of the Guilford County Registry; said iron pipe also being located N 85°53'52" W a distance of 437.47 feet from an existing angle iron; said angle iron being in the aforesaid common line and at a common corner of Deed Book 3222 Page 644 and Deed Book 6377 Page 1998;

Thence with the common line of Deed Book 1826 Page 75 and Deed Book 4552 Page 2029 of the Guilford County Registry and continuing with the conservation easement area N 86°01'57" W a distance of 202.07 feet to a 5/8" rebar set with a CE cap (CORNER 157);

Thence leaving the aforesaid common line and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 24°14'33" W a distance of 54.50 feet to a 5/8" rebar set with a CE cap (CORNER 158);
- (2) N 32°37'24" W a distance of 311.85 feet to a 5/8" rebar set with a CE cap (CORNER 159);

Thence continuing with the conservation easement area N 33°03'58" W the following (3) distances:

- (1) 245.61 feet to a 5/8" rebar set with a CE cap (CORNER 160);
- (2) 25.50 feet to a 5/8" rebar set with a CE cap (CORNER 161);
- (3) 148.32 feet to a 5/8" rebar set with a CE cap (CORNER 162);

Thence continuing with the conservation easement area N 26°25'03" W a distance of 152.99 feet to a 5/8" rebar set with a CE cap (CORNER 163); said rebar being located in a common line with Deed Book 1826 Page 75 and Deed Book 7310 Page 3064 of the Guilford County Registry; said rebar also being located S 86°07'36" E a distance of 325.25 feet from a 5/8" rebar set with a CE cap (CORNER 168);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°07'36" E a distance of 200.81 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 3.61 acres, being the same more or less.

Conservation Easement Area "Q":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 168), said rebar being in a common line with Deed Book 1826 Page 75 and Deed Book 7310 Page 3064 of the Guilford County Registry, and located N 86°07'36" W a distance of 325.25 feet from a 5/8" rebar set with a CE cap (CORNER 163);

Thence leaving the aforementioned common line and with the conservation easement area the following (2) courses and distances:

- (1) S 21°18'00" W a distance of 71.70 feet to a 5/8" rebar set with a CE cap (CORNER 169);
- (2) S 31°30'34" W a distance of 230.79 feet to a 5/8" rebar set with a CE cap (CORNER 170); said rebar being the northernmost corner of a 25 foot wide reserved stream crossing;

Thence continuing with the conservation easement area S 54°54'27" E the following (2) distances:

- (1) 25.43 feet to a 5/8" rebar set with a CE cap (CORNER 171); said rebar being the easternmost corner of a 25 foot wide reserved stream crossing;
- (2) 86.12 feet to a 5/8" rebar set with a CE cap (CORNER 172);

Thence continuing with the conservation easement area the following (3) courses and distances:

- (1) S 32°03'54" E a distance of 116.15 feet to a 5/8" rebar set with a CE cap (CORNER 173);
- (2) S 08°03'17" E a distance of 173.81 feet to a 5/8" rebar set with a CE cap (CORNER 174);
- (3) S 35°45'51" E a distance of 221.06 feet to a 5/8" rebar set with a CE cap (CORNER 175); said rebar being located in a common line with Deed Book 1826 Page 75 and Deed Book 3222 Page 646 of the Guilford County Registry; said rebar also being located N 86°01'57" W a distance of 417.00 feet from an existing 3/4" iron pipe; said iron pipe being at a common

corner of Deed Book 3222 Page 646 and Deed Book 4552 Page 2029 and in a common line with Deed Book 1826 Page 75;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°01'57" W a distance of 19.82 feet to a calculated point; said calculated point being located at the common corner of Deed Book 3222 Page 646 and Deed Book 7729 Page 699 and in the common line with Deed Book 1826 Page 75 of the Guilford County Registry;

Thence leaving the aforementioned common line and with the common line of Deed Book 1826 Page 75 and Deed Book 7729 Page 699 of the Guilford County Registry and continuing with the conservation easement area N 86°01'57" W a distance of 170.04 feet to a 5/8" rebar set with a CE cap (CORNER 181); said rebar being located S 86°01'57" E a distance of 270.62 feet from an existing stone; said stone being at a common corner of Deed Book 1826 Page 75, Deed Book 3728 Page 1496 and Deed Book 7729 Page 699 and in the common line with Deed Book 7217 Page 2553;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 28°01'13" W a distance of 166.60 feet to a 5/8" rebar set with a CE cap (CORNER 182);
- (2) N 07°38'21" W a distance of 193.48 feet to a 5/8" rebar set with a CE cap (CORNER 183);

Thence continuing with the conservation easement area N 48°41'27" W the following (2) distances:

- (1) 100.37 feet to a 5/8" rebar set with a CE cap (CORNER 184); said rebar being the southernmost corner of a 25 foot wide reserved stream crossing;
- (2) 25.07 feet to a 5/8" rebar set with a CE cap (CORNER 185); said rebar being the westernmost corner of a 25 foot wide reserved stream crossing;

Thence continuing with the conservation easement area S 48°14'02" W a distance of 62.51 feet to a 5/8" rebar set with a CE cap (CORNER 186); said rebar being located in the common line with Deed Book 1826 Page 75 and Deed Book 7217 Page 2553 of the Guilford County Registry; said rebar also being located N 03°58'43" E a distance of 362.14 feet from an existing stone;

Thence with the aforesaid common line and continuing with the conservation easement area N 03°58'43" E a distance of 402.12 feet to an existing 3/4" iron pipe (CORNER 187);

Thence leaving the aforementioned common line and with the common line of Deed Book 1826 Page 75 and Deed Book 7310 Page 3064 and continuing with the conservation easement area S 86°07'36" E the following (2) distances:

- (1) 25.73 feet to a 5/8" rebar set with a CE cap (CORNER 188);
- (2) 221.37 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 3.05 Acres, being the same more or less.

Being all of that area of land containing a total of 6.66 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Bryan David Hopkins; Job#

140431-CE, Sheet 11. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 1826, PG: 75...

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEOID: 12A...



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee PHILLIP B. KEE, PLS L-4647

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR REPAIRING.

Paul Love REVIEW OFFICER DATE 9-17-15

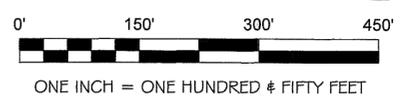
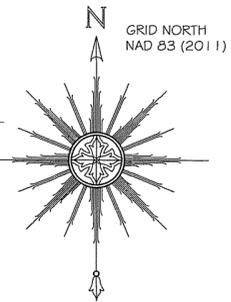
CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Bryan David Hopkins BRYAN DAVID HOPKINS DATE 9-11-15

ATTESTED BY: Jeff L. Thigpen JEFF L. THIGPEN DATE 9-11-15

BK: P 190 PG: 54-66 RECORDED: 11-03-2015 10:23:40 AM BY: MEREDITH APPLE DEPUTY-GS

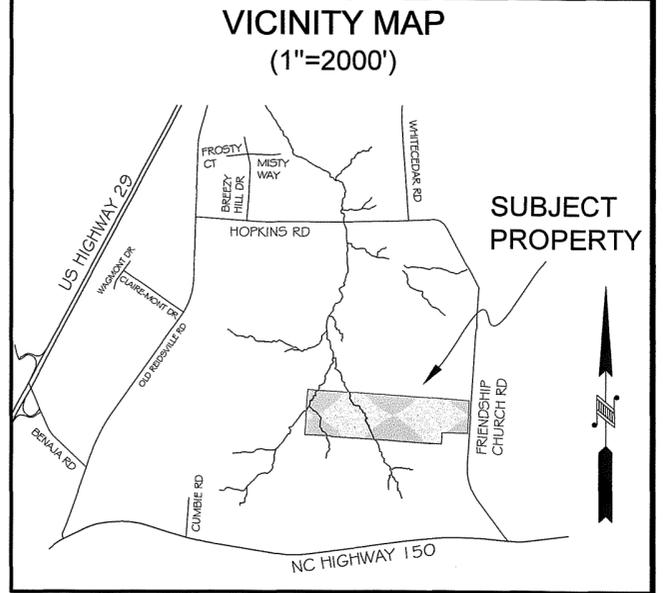


LINE TABLE with columns: LINE, BEARING, DISTANCE. Rows 1-7 detailing boundary segments.

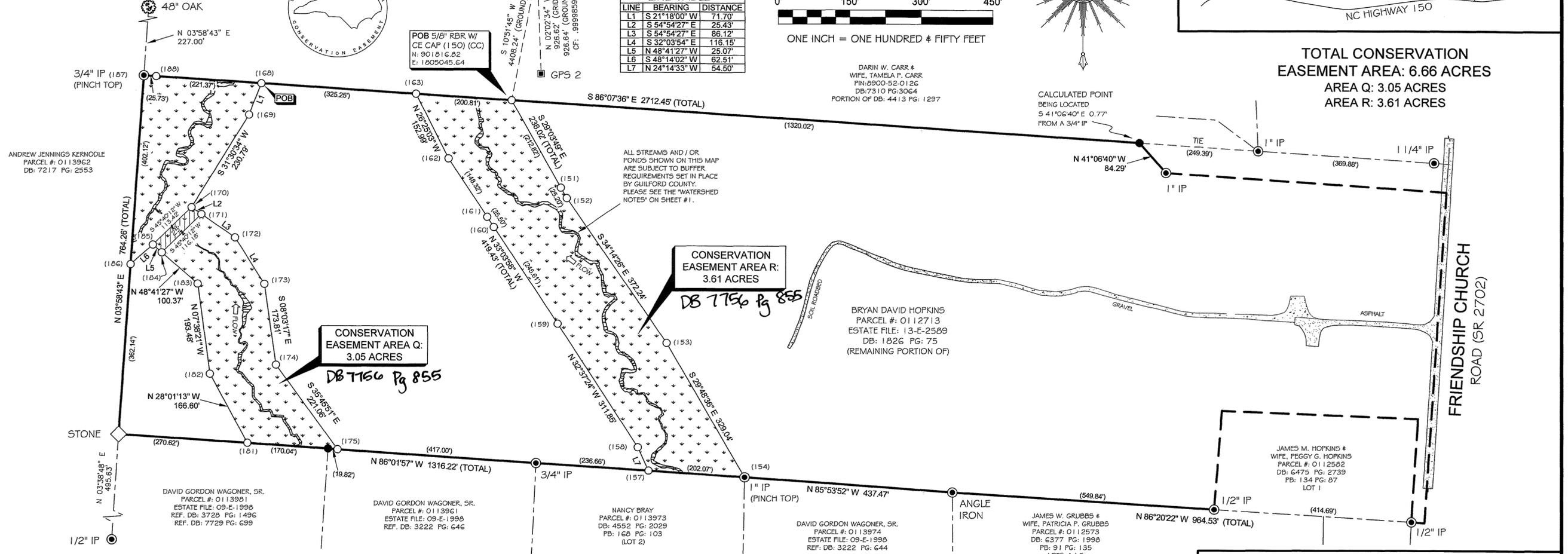
DARIN W. CARR & WIFE, TAMELA F. CARR PIN: 0900-52-0126 DB: 7310 PG: 3064 PORTION OF DB: 4413 PG: 1297

CALCULATED POINT BEING LOCATED S 41°06'40" E 0.77' FROM A 3/4" IP

TOTAL CONSERVATION EASEMENT AREA: 6.66 ACRES AREA Q: 3.05 ACRES AREA R: 3.61 ACRES



GRID TIE INFORMATION table with columns: GPS 1, GPS 2, 1" IPC "KEE" (CC), 1" IPC "KEE" (CC), NC STATE PLANE COORDINATES, NC STATE PLANE COORDINATES.



SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. UTILITIES WERE LOCATED BASED ON VISIBLY ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007. 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES. 10. ALL STRUCTURES NOT LOCATED WITHIN 100 FEET OF THE CONSERVATION EASEMENT AREAS SHOWN ON THIS MAP, HAVE BEEN REMOVED PER GUILFORD COUNTY PLANNING DEPARTMENT REQUIREMENTS.

LEGEND:

- CALCULATED POINT NOT SET ○ 5/8" RBR W/ "CE" CAP ○ EXISTING IRON PIN (AS NOTED) ■ 1" IRON PIPE W/ "KEE" CAP (CC) ◆ PLANTED STONE ○ TREE (AS NOTED) — BOUNDARY LINE - - BOUNDARY LINE NOT SURVEYED - - - TIE LINE ONLY - - - ADJOINING DEED LINES [Stippled] CONSERVATION EASEMENT AREA [Wavy lines] STREAM [Hatched] ASPHALT [Diagonal lines] RESERVED STREAM CROSSING [Dotted] GRAVEL [Cross-hatched] SOIL ROADBED [Diagonal lines] PB: PLAT BOOK DB: DEED BOOK PG: PAGE IP: IRON PIPE IPC: IRON PIPE W/ CAP R/W: RIGHT OF WAY N.A.D.: NORTH AMERICAN DATUM N.A.V.D.: NORTH AMERICAN VERTICAL DATUM SPC: STATE PLANE COORDINATES NGS: NATIONAL GEODETIC SURVEY CF: COMBINED FACTOR CC: CONTROL CORNER CE: CONSERVATION EASEMENT POB: POINT OF BEGINNING

COORDINATE TABLE (USFT)

Table with columns: POINT #, NORTHING, EASTING. Rows 150-188 providing coordinate data for various points on the plat.

EXCLUSION MAP

A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAEJ DMS SITE ID: 96315

PARCEL NUMBER: 0112713 CURRENT OWNER(S) LISTED AS: BRYAN DAVID HOPKINS MAILING ADDRESS: 7541 FRIENDSHIP CHURCH RD, BROWNS SUMMIT, NC 27214 PHONE NUMBER(S): (336) 978-8680

DEED REFERENCE: ESTATE FILE: 05-E-941 (BOOK: 1826 PAGE: 75) MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA SURVEY BY: DD,KP,NC DRAWN BY: NH CHECKED BY: NC SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE

SHEET SIZE: 18"x24" SHEET #: 11 OF 13 SCALE: 1"=150'

Logo for Kee Mapping & Surveying, P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

BK: R 7756
PG: 679-695
RECORDED:
11-03-2015
10:57:58 AM
BY: MEREDITH APPLE
DEPUTY-G6



2015059071

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$34.00
STATE OF NC
REAL ESTATE
EXTX \$649.00

Excise Tax: \$649.00

179

STATE OF NORTH CAROLINA

PLU ISAACSON

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

GUILFORD COUNTY

**SPO File Number: 41-AAAEK
DMS Project Number: 96315**

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Jefferson T. Hopkins and Mary Ann Hopkins, (“**Grantor**”), whose mailing address is 8247 Whitecedar Road, Brown Summit, NC 27214, to the State of North Carolina, (“**Grantee**”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 *et seq.*, the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 94.46, 34.64, and 34.30 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 4507 at Page 1769, Deed Book 4507 at Page 1613, and Deed Book 3557 at Page 282** respectively of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas A, B, C, and I containing 6.34, 2.75, 4.47, and 9.59 **acres** respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for the State of North Carolina Division of Mitigation Services, Candy Creek Stream Mitigation Site, DMS Site No. 96315, Current Owners Listed as: Jefferson T. and Mary Ann Hopkins," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

The Grantor reserves the right, for himself, his successors and assigns, to operate motorized vehicles within Crossing Area(s) described on the survey recorded in Plat Book 190, Page 54-66 of the Guilford County Registry as "reserved stream crossing". Said crossing shall not exceed 25 feet in width, and must be maintained and repaired by Grantor, his successors or assigns to prevent degradation of the Conservation Easement Area.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the

Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center

Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Jefferson T. Hopkins (SEAL)
Jefferson T. Hopkins

Mary Ann Hopkins (SEAL)
Mary Ann Hopkins

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Jennifer Fowler, a Notary Public in and for the County and State aforesaid, do hereby certify that Jefferson T. Hopkins and Mary Ann Hopkins, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27
day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:
11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

***Jefferson T. Hopkins & Mary Ann Hopkins
SPO FILE NUMBER: 41-AAAEK DMS SITE ID: 96315***

The following conservation easement areas are located off of White Cedar Road and Old Reidsville Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Jefferson T. Hopkins & Mary Ann Hopkins through Deed Book 4507 Page 1769 & Deed Book 4057 Page 1613 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "A":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 1), said rebar being in a common line of Tract I of Deed Book 4507 Page 1769 of the Guilford County Registry and Deed Book 1182 Page 877 in the Rockingham County Registry, and located N 32°45'40" W a horizontal ground distance of 2859.19 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; and also being located N 85°09'24" W a distance of 1275.85 feet from an existing 3/4" iron pipe; said iron pipe being a common corner in the aforementioned common line;

Thence with the conservation easement area the following (3) courses and distances:

- (1) S 20°21'31" W a distance of 454.51 feet to a 5/8" rebar set with a CE cap (CORNER 2);
- (2) S 50°36'00" W a distance of 222.16 feet to a 5/8" rebar set with a CE cap (CORNER 3);
- (3) S 45°16'22" W a distance of 220.25 feet to a 5/8" rebar set with a CE cap (CORNER 4);

Thence continuing with the conservation easement area N 88°43'08" W the following (3) distances:

- (1) 84.24 feet to a 5/8" rebar set with a CE cap (CORNER 5); said rebar being the southeast corner of a 25 foot wide reserved stream crossing;
- (2) 25.22 feet to a 5/8" rebar set with a CE cap (CORNER 6); said rebar being the southwest corner of a 25 foot wide reserved stream crossing;
- (3) 25.78 feet to a 5/8" rebar set with a CE cap (CORNER 7);

Thence continuing with the conservation easement area the following (2) courses and distances:

- (1) S 02°04'51" E a distance of 203.59 feet to a 5/8" rebar set with a CE cap (CORNER 8);

- (2) S 01°23'01" W a distance of 172.36 feet to a 5/8" rebar set with a CE cap (CORNER 9); said rebar being located in a common line of Tracts I & II of Deed Book 4507 Page 1769 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 84°02'35" W a distance of 279.58 feet to an existing 3/4" iron pipe (CORNER 69); said iron pipe being a common corner between Tracts I & II of Deed Book 4507 Page 1769 and Deed Book 6947 Page 1766 of the Guilford County Registry; and located S 87°13'38" E a distance of 569.69 feet from an existing 3/4" iron rod;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (3) courses and distances:

- (1) N 60°29'49" E a distance of 92.45 feet to a 5/8" rebar set with a CE cap (CORNER 70);
- (2) N 04°19'05" E a distance of 219.80 feet to a 5/8" rebar set with a CE cap (CORNER 71);
- (3) N 06°27'29" E a distance of 189.71 feet to a 5/8" rebar set with a CE cap (CORNER 72);

Thence continuing with the conservation easement area N 56°10'54" E the following (3) distances:

- (1) 266.87 feet to a 5/8" rebar set with a CE cap (CORNER 73); said rebar being the northwest corner of a 25 foot wide reserved stream crossing;
- (2) 33.96 feet to a 5/8" rebar set with a CE cap (CORNER 74); said rebar being the northeast corner of a 25 foot wide reserved stream crossing;
- (3) 254.98 feet to a 5/8" rebar set with a CE cap (CORNER 75);

Thence continuing with the conservation easement area the following (2) courses and distances:

- (4) N 11°26'12" E a distance of 147.30 feet to a 5/8" rebar set with a CE cap (CORNER 76);
- (5) N 34°13'45" E a distance of 209.56 feet to a 5/8" rebar set with a CE cap (CORNER 77); said rebar being in a common line of Tract I of Deed Book 4507 Page 1769 of the Guilford County Registry and Deed Book 1182 Page 877 of the Rockingham County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area S 85°09'24" E a distance of 169.73 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 6.34 Acres, being the same more or less.

Conservation Easement Area "B":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 9); said rebar being in a common line of Tracts I & II of Deed Book 4507 Page 1769 of the Guilford County Registry; and located S 01°23'01" W a distance of 172.36 feet from a 5/8" rebar set with a CE cap (CORNER 8);

Thence with the conservation easement area the following (3) courses and distances:

- (1) S 01°23'01" W a distance of 27.69 feet to a 5/8" rebar set with a CE cap (CORNER 10);

- (2) S 24°47'52" W a distance of 211.73 feet to a 5/8" rebar set with a CE cap (CORNER 11);
- (3) S 03°27'26" E a distance of 304.15 feet to a 5/8" rebar set with a CE cap (CORNER 12); said rebar being located N 85°09'20" W a distance of 2222.03 feet from a mag nail set; said mag nail being a common corner between Tract II of Deed Book 4507 Page 1769, the remaining portion of Deed Book 4057 Page 1613 and Deed Book 3921 Page 990 of the Guilford County Registry;

Thence with the common line of Tract II of Deed Book 4507 Page 1769 and the remaining portion of Deed Book 4057 Page 1613 and continuing with the conservation easement area N 85°09'20" W a distance of 226.98 feet to an existing axle (CORNER 64); said axle being in a common line with Deed Book 3676 Page 2054, and a common corner between Tract II of Deed Book 4507 Page 1769 and the remaining portion of Deed Book 4057 Page 1613 of the Guilford County Registry;

Thence with the common line of Tract II of Deed Book 4507 Page 1769 and Deed Book 3676 Page 2054 of the Guilford county Registry and continuing with the conservation easement area N 02°03'52" E the following (2) distances:

- (1) 84.58 feet to an existing 1/2" iron pipe (CORNER 65);
- (2) 70.36 feet to an existing 1/2" iron pipe (CORNER 66); said iron pipe being a common corner between Deed Book 3676 Page 2054 and Deed Book 4467 Page 285 and in a common line with Tract II of Deed Book 4507 Page 1769 of the Guilford County Registry;

Thence with the common line of Tract II of Deed Book 4507 Page 1769 and Deed Book 4467 Page 285 and continuing with the conservation easement area N 02°03'52" E a distance of 100.09 feet to an existing 3/4" iron rod (CORNER 67); said iron rod being a common corner between Deed Book 4467 Page 285 and Deed Book 6947 Page 1766 and in a common line with Tract II of Deed Book 4507 Page 1769 of the Guilford County Registry;

Thence with the common line of Tract II of Deed Book 4507 Page 1769 and Deed Book 6947 Page 1766 and the continuing with the conservation easement area N 02°03'52" E the following (2) distances:

- (1) 109.85 feet to an existing 1" iron pipe (CORNER 68);
- (2) 168.81 feet to an existing 3/4" iron pipe (CORNER 69); said iron pipe being located at a common corner of Tracts I & II of Deed Book 4507 Page 1769 and Deed Book 6947 Page 1766 of the Guilford County Registry;

Thence with a common line of Tracts I & II of Deed Book 4507 Page 1769 and continuing with the conservation easement S 84°02'35" E a distance of 279.58 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 2.75 Acres, being the same more or less.

Conservation Easement Area "C":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 12), said rebar being in a common line of Tract II Deed Book 4507 Page 1769 and the remaining portion of Deed Book 4057 Page 1613; and located N 85°09'20" W a distance of 2222.03 feet from a mag nail set; said mag nail being at a common

corner between Tract II of Deed Book 4507 Page 1769, the remaining portion of Deed Book 4057 Page 1613 and Deed Book 3921 Page 990 of the Guilford County Registry;

Thence with the conservation easement area S 03°27'26" E a distance of 157.30 feet to a 5/8" rebar set with a CE cap (CORNER 13); said rebar being the northernmost corner of a 25 foot wide reserved stream crossing;

Thence continuing with the conservation easement area S 38°54'36" E the following (2) distances:

- (1) 26.48 feet to a 5/8" rebar set with a CE cap (CORNER 14); said rebar being the easternmost corner of a 25 foot wide reserved stream crossing;
- (2) 176.46 feet to a 5/8" rebar set with a CE cap (CORNER 15);

Thence continuing with the conservation easement area the following (2) courses and distances:

- (1) S 32°20'38" E a distance of 565.19 feet to a 5/8" rebar set with a CE cap (CORNER 16);
- (2) S 00°25'35" E a distance of 23.61 feet to an existing 3/4" iron pipe (CORNER 17); said iron pipe being located on a common line with Deed Book 4057 Page 1613 and at a common corner of Deed Book 5891 Page 1013 and Deed Book 6507 Page 2573 of the Guilford County Registry;

Thence with the common line of Deed Book 4057 Page 1613 and Deed Book 6507 Page 2573 and continuing with the conservation easement area N 88°13'41" W a distance of 255.88 feet to a 5/8" rebar set with a CE cap (CORNER 56); said rebar being located S 88°13'41" E a distance of 244.61 feet from an existing 1/2" iron pipe; said iron pipe being in a common line with Deed Book 4057 Page 1613 and at a common corner of Deed Book 6507 Page 2573 and Deed Book 2946 Page 173 of the Guilford County Registry;

Then leaving the aforesaid common line and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 39°17'35" W a distance of 104.38 feet to a 5/8" rebar set with a CE cap (CORNER 57);
- (2) N 21°13'07" W a distance of 318.19 feet to a 5/8" rebar set with a CE cap (CORNER 58);

Thence continuing with the conservation easement area N 41°23'40" W the following (3) distances:

- (1) 118.56 feet to a 5/8" rebar set with a CE cap (CORNER 59); said rebar being the southernmost corner of a 25 foot wide reserved stream crossing;
- (2) 26.11 feet to a 5/8" rebar set with a CE cap (CORNER 60); said rebar being the westernmost corner of a 25 foot wide reserved stream crossing;
- (3) 83.31 feet to a 5/8" rebar set with a CE cap (CORNER 61);

Thence continuing with the conservation easement area N 23°51'19" W a distance of 201.11 feet to a 5/8" rebar set with a CE cap (CORNER 62); said rebar being located in a common line with Deed Book 4057 Page 1613 and Deed Book 3676 Page 2054 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 02°03'52" E the following (2) distances:

- (1) 79.94 feet to an existing 3/4" iron pipe (CORNER 63);
- (2) 15.07 feet to an existing axle (CORNER 64); said axle being in a common line with Deed Book 3676 Page 2054 and at a common corner between Tract II of Deed Book 4507 Page 1769 and the remaining portion of Deed Book 4057 Page 1613 of the Guilford County Registry;

Thence leaving the aforementioned common line and with the common line of Tract II of Deed Book 4507 Page 1769 and the remaining portion of Deed Book 4057 Page 1613 of the Guilford County Registry and continuing with the conservation easement area S 85°09'20" E a distance of 226.98 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 4.47 Acres, being the same more or less.

Being all of that area of land containing a total of 13.56 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Jefferson T. Hopkins and Mary Ann Hopkins; Job# 140431-CE, sheet 2. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

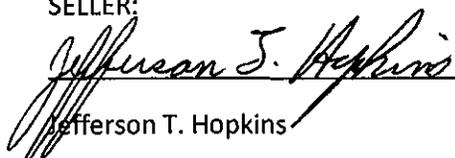
PROPERTY TAX DISCLOSURE STATEMENT

Seller agrees that if there is any recapture of deferred taxes concerning sale of easement of 23.15 acres as shown in Exhibit A to Wildlands Engineering, that these taxes for deferred recapture will be the responsibility of the Seller, and Seller agrees to pay them promptly. Sellers agree to pay all recapture of Guilford County deferred taxes that result from the sale of said easement on 23.15 acres to Buyer, and Buyer is not responsible for paying any part of the deferred tax recapture resulting from its purchase 23.15 acres. Buyer and Seller release Isaacson, Isaacson Sheridan Fountain and Leftwich LLP from any liability or responsibility concerning these deferred taxes.

Closing Attorney has not been retained to take any action against Seller should Seller fail to pay the deferred tax recapture resulting from this sale. Closing attorney has no responsibility for making sure that Seller deferred tax status continues on their remaining acreage.

This the 27th day of October, 2015

SELLER:



Jefferson T. Hopkins



Mary Ann Hopkins

GUILFORD COUNTY, NORTH CAROLINA

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 4507 - PG: 1769 AND DB: 4057 - PG: 1613; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

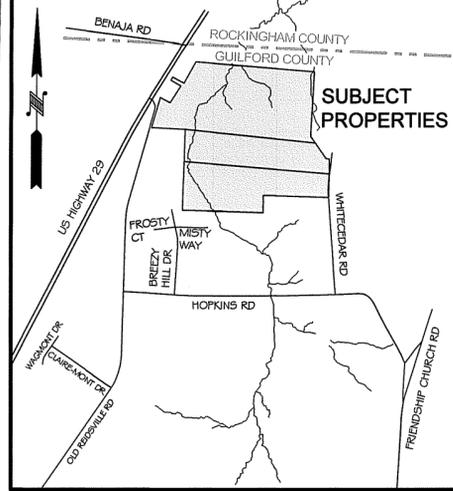
APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

BK: P 190 PG: 54-66 RECORDED 11-03-2015 10:23:40 AM BY: MEREDITH AAPPLE DEPUTY-GD NC FEE \$273.00

VICINITY MAP

SCALE: 1" = 2000'



I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEOID: 12A AVERAGE COMBINED FACTOR: 9.9998597 POSITIONAL ACCURACY: HORIZONTAL: 0.04 UNITS: USFT CORS USED: NCWC, NCR, NCGS

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



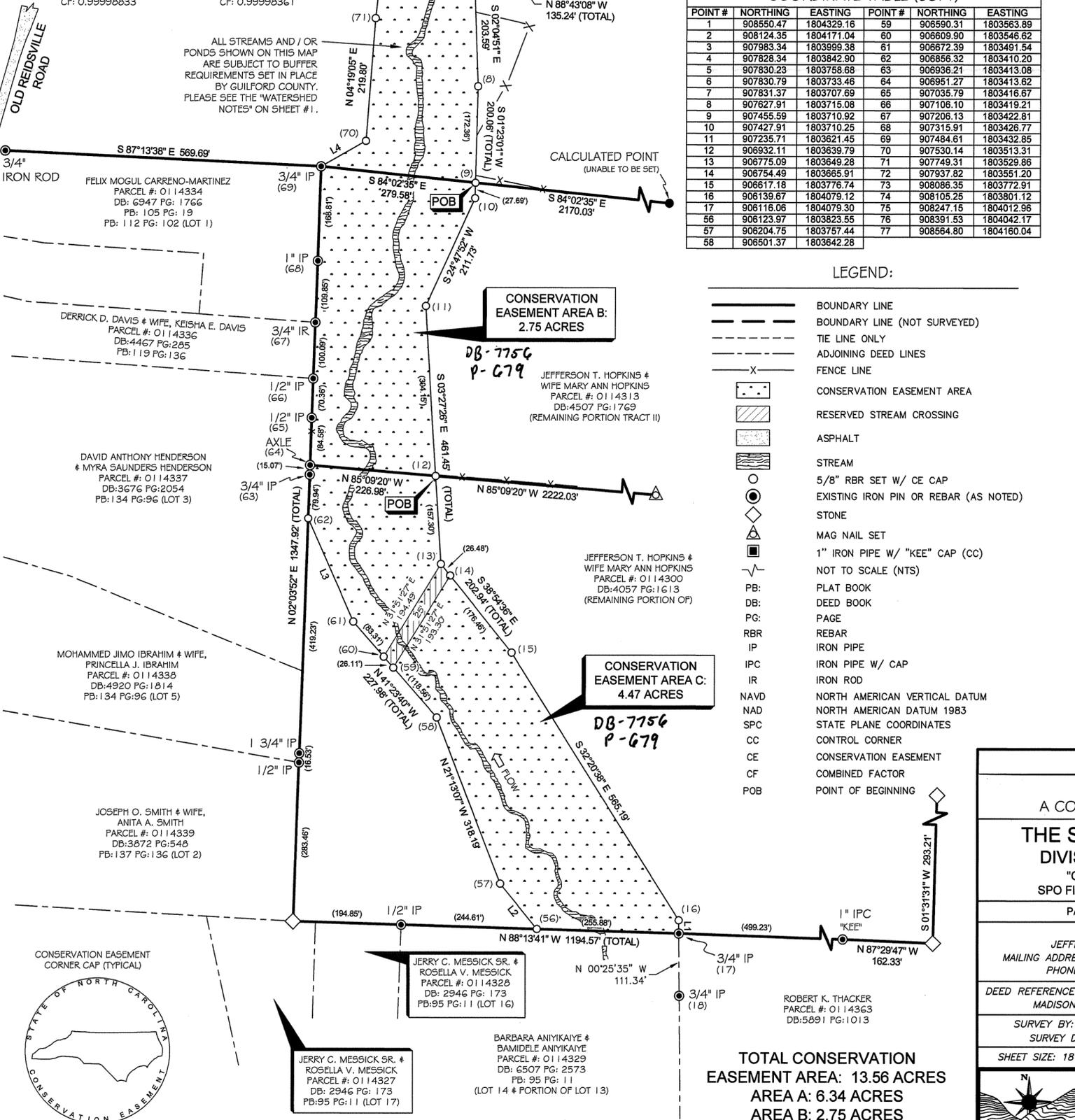
THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee PHILLIP B. KEE, PLS L-4647

GRID TIE INFORMATION

Table with 2 columns: GPS 1 and GPS 2. Each column lists coordinates (N, E, Z) and combined factors for 1" IPC 'KEE' (CC) and NC State Plane Coordinates.

ALL STREAMS AND/OR PONDS SHOWN ON THIS MAP ARE SUBJECT TO BUFFER REQUIREMENTS SET IN PLACE BY GUILFORD COUNTY. PLEASE SEE THE 'WATERSHED NOTES' ON SHEET #1.



LINE TABLE with columns: LINE, BEARING, DISTANCE. Lists lines L1 through L4 with their respective bearings and distances.

COORDINATE TABLE (USFT) with columns: POINT #, NORTHING, EASTING. Lists 58 points with their coordinates.

LEGEND: Lists symbols for boundary lines, tie lines, fences, easement areas, stream crossings, asphalt, streams, iron pins, stones, mag nail sets, iron pipes, iron rods, datums, coordinates, control corners, and points of beginning.

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Jefferson T. Hopkins 9-11-15 DATE
Mary Ann Hopkins 9-11-15 DATE
Attested by: Phillip B. Kee 9-11-15 DATE

SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES. THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000 DATED 07/03/2007.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.

ONE INCH = ONE-HUNDRED FIFTY FEET

EXCLUSION MAP

A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAEK DMS SITE ID: 96315

PARCEL NUMBER(S): 0114284, 0114313 & 0114300

CURRENT OWNER(S) LISTED AS: JEFFERSON T. HOPKINS & WIFE, MARY ANN HOPKINS MAILING ADDRESS: 8255 WHITE CEDAR ROAD, BROWN SUMMIT, NC 27214 PHONE NUMBER(S): (336) 669-3313, (336) 669-3316

DEED REFERENCE: BOOK: 4507 PAGE: 1769 & BOOK: 4057 PAGE: 1613 MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA

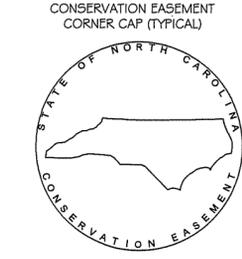
SURVEY BY: DD, KP, NC DRAWN BY: EC CHECKED BY: NC SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE

SHEET SIZE: 18"x24" SHEET #: 2 OF 13 SCALE: 1"=150'



P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

TOTAL CONSERVATION EASEMENT AREA: 13.56 ACRES AREA A: 6.34 ACRES AREA B: 2.75 ACRES AREA C: 4.47 ACRES



GUILFORD COUNTY, NORTH CAROLINA

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 3557 PG: 282 AND DB: NA PG: NA...

GPS METADATA

CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEIOD: 12A...

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.

THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee PHILLIP B. KEE, PLS L-4647



THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY, THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16th DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul Love REVIEW OFFICER DATE 9-16-15

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love REVIEW OFFICER DATE 9-16-15

I, Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

CERTIFICATE OF OWNERSHIP AND DEDICATION:

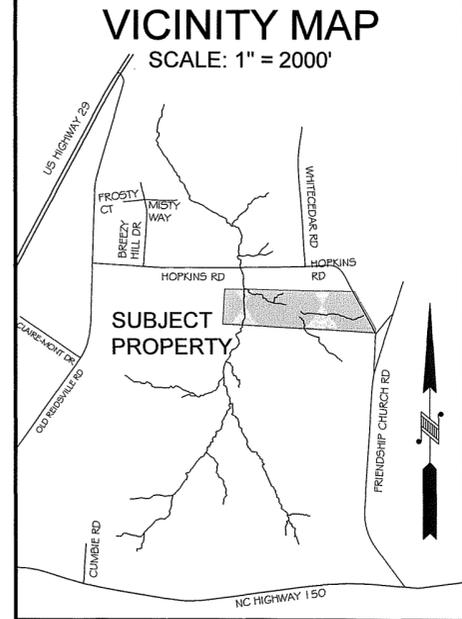
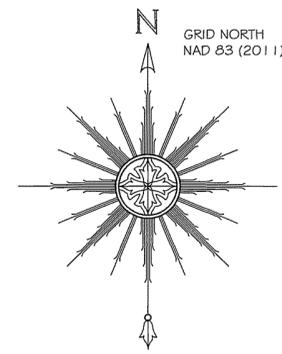
I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Jefferson T. Hopkins 9-11-15 DATE MARY ANN HOPKINS 9-11-15 DATE

MARY ANN HOPKINS DATE ATTESTED BY: Kelsie W. Day 9-11-15 DATE

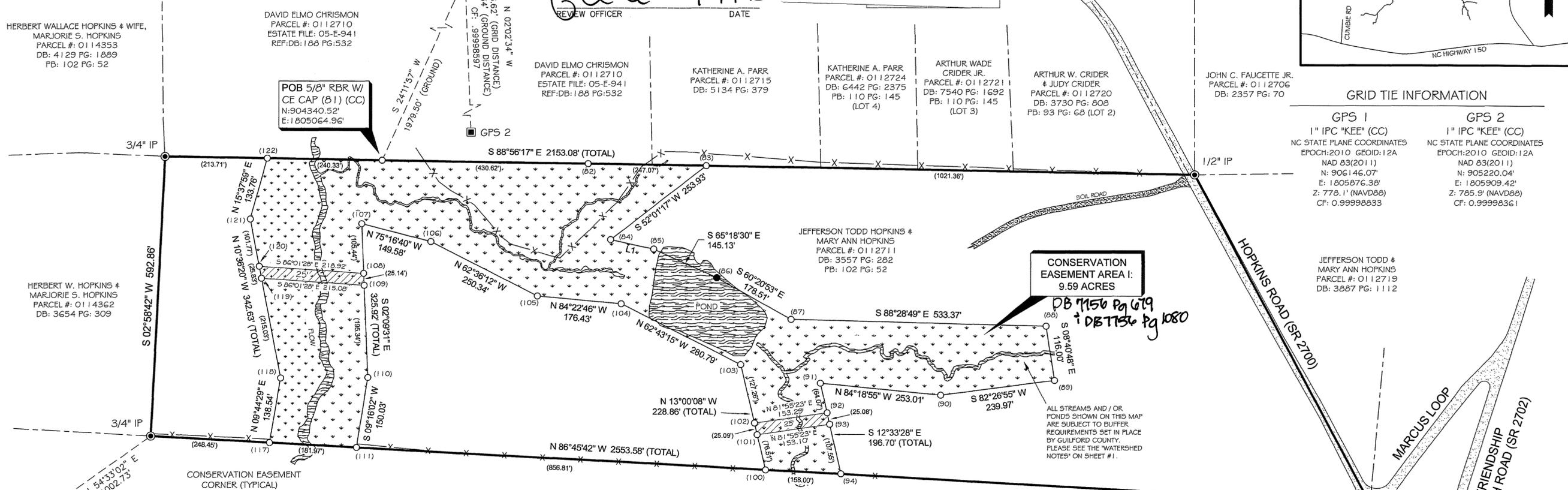
NAME DATE

BK: P 190 PG: 54-66 RECORDED: 11-03-2015 10:23:40 AM BY: MEREDITH AAPPLE DEPUTY-GD 2015058058 GUILFORD COUNTY, NC JEFF L. THIGPEN REGISTER OF DEEDS NC FEE \$273.00



GRID TIE INFORMATION

Table with 2 columns: GPS 1 and GPS 2. Includes coordinates (NAD 83(2011), NAVD 88), epoch, geoid, and combined factor.



DAVID ELMO CHRISMON PARCEL #: 0112710 ESTATE FILE: 05-E-941 REF:DB:188 PG:532

DAVID ELMO CHRISMON PARCEL #: 0112710 ESTATE FILE: 05-E-941 REF:DB:188 PG:532

KATHERINE A. PARR PARCEL #: 0112715 DB: 5134 PG: 379

KATHERINE A. PARR PARCEL #: 0112724 DB: 6442 PG: 2375 PB: 110 PG: 145 (LOT 4)

ARTHUR WADE CRIDER JR. PARCEL #: 0112721 DB: 7540 PG: 1692 PB: 110 PG: 145 (LOT 3)

ARTHUR W. CRIDER & JUDY CRIDER PARCEL #: 0112720 DB: 3730 PG: 808 PB: 93 PG: 68 (LOT 2)

JOHN C. FAUCETTE JR. PARCEL #: 0112706 DB: 2357 PG: 70

JEFFERSON TODD HOPKINS & MARY ANN HOPKINS PARCEL #: 0112711 DB: 3557 PG: 282 PB: 102 PG: 52

CONSERVATION EASEMENT AREA I: 9.59 ACRES

DB 7156 Pg 619 DB 7156 Pg 1080

ALL STREAMS AND / OR PONDS SHOWN ON THIS MAP ARE SUBJECT TO BUFFER REQUIREMENTS SET IN PLACE BY GUILFORD COUNTY. PLEASE SEE THE WATERSHED NOTES' ON SHEET #1.

HERBERT WALLACE HOPKINS & SPOUSE, MARJORIE HOPKINS PARCEL #: 0112712 DB: 3654 PG: 306

LINE TABLE with columns: LINE, BEARING, DISTANCE. L1 S 77°19'36" E 92.20'

COORDINATE TABLE (USFT) with columns: POINT #, NORTHING, EASTING. Points 81 through 101.



SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.
6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES.
7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP # 371089000J DATED 07/03/2007.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT RESTORABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA.
9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.
10. ALL STRUCTURES NOT LOCATED WITHIN 100 FEET OF THE CONSERVATION EASEMENT AREAS SHOWN ON THIS MAP, HAVE BEEN REMOVED PER GUILFORD COUNTY PLANNING DEPARTMENT REQUIREMENTS.

LEGEND: BOUNDARY LINE, BOUNDARY LINE (NOT SURVEYED), TIE LINE ONLY, ADJOINING DEED LINES, FENCE LINE, CONSERVATION EASEMENT AREA, RESERVED STREAM CROSSING, ASPHALT, STREAM/POND, 5/8" RBR SET W/ CE CAP, EXISTING IRON PIPE OR REBAR (AS NOTED), CALCULATED POINT (CP), 1" IRON PIPE W/ "KEE" CAP (CC), NOT TO SCALE (NTS), IRON PIPE, IRON PIPE W/ CAP, NORTH AMERICAN VERTICAL DATUM, NORTH AMERICAN DATUM 1983, STATE PLANE COORDINATES, CONTROL CORNER, CONSERVATION EASEMENT, COMBINED FACTOR, POINT OF BEGINNING.



EXCLUSION MAP. A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAEK DMS SITE ID: 96315. PARCEL NUMBER: 0112711. CURRENT OWNER(S) LISTED AS: JEFFERSON TODD HOPKINS & WIFE, MARY ANN HOPKINS. DEED REFERENCE: BOOK: 3557 PAGE: 282. MAPS & SURVEYING logo.

BK: R 7756
PG: 772-784
RECORDED:
11-03-2015
11:14:24 AM
BY: MEREDITH A APPLE
DEPUTY-GB



2015059083
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$28.00
STATE OF NC
REAL ESTATE
EXTX \$145.00

Excise Tax: \$145.00

STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

13^M

P/u Isaacson

GUILFORD COUNTY

SPO File Number: 41-AAAEL

DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by Joe W. Hopkins and wife, Lisa Rich Hopkins, (“**Grantor**”), whose mailing address is 7541 Friendship Church Rd, Browns Summit, NC 27214, to the State of North Carolina, (“**Grantee**”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 34.01 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 3502 at Page 1633** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Area M containing a total of 7.11 acres as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: Joe W. Hopkins and Wife, Lisa Rich Hopkins," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 190 Pages 54-66.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Joe W. Hopkins (SEAL)
Joe W. Hopkins

Lisa R. Hopkins by Joe W. Hopkins her attorney in fact
Lisa Rich Hopkins by Joe W. Hopkins her attorney in fact

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that Joe W. Hopkins, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27th day of October, 2015.

Kathy M. Hendrix
Notary Public
My commission expires: 11/29/18



**STATE OF NORTH CAROLINA
COUNTY OF GUILFORD**

I, the undersigned, a Notary Public, do hereby certify that JOE W. HOPKINS, Attorney in Fact for LISA R. HOPKINS, personally appeared before me this day and being by me duly sworn says that he executed the foregoing and annexed instrument for and in behalf of LISA R. HOPKINS and that his authority to execute and acknowledge said instrument is contained in an instrument duly executed, acknowledged and recorded in the Office of the Register of Deeds of Guilford County, North Carolina in Book 7756, Page 770, and that this instrument was executed under and by virtue of the authority given by said instrument granting JOE W. HOPKINS power of attorney and that the said JOE W. HOPKINS acknowledged the due execution of the foregoing and annexed instrument for the purposes therein expressed for and in behalf of the said LISA R. HOPKINS.

WITNESS my hand and official seal this the 27th day of October, 2015.



Kathy M. Hendrix
Notary Public
My commission expires: 11/29/18

Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

**Joe W. Hopkins and wife, Lisa Rich Hopkins
SPO FILE NUMBER: 41-AAAEL DMS SITE ID: 96315**

The following conservation easement area is located off of Friendship Church Road (SR 2702) within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Joe W. Hopkins and wife, Lisa Rich Hopkins through Deed Book 3502 Page 1633 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "M":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 128), said rebar being in a common line with Deed Book 3502 Page 1633 and Deed Book 3654 Page 306 of the Guilford County Registry, and located S 21°09'28" W a horizontal ground distance of 3243.81 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; said rebar also being located N 86°41'49" W a distance of 1411.79 feet from a 1" iron pipe set with a Kee cap in the aforesaid common line;

Thence leaving the aforementioned common line and with the conservation easement area the following (5) courses and distances:

- (1) S 04°26'19" E a distance of 193.22 feet to a 5/8" rebar set with a CE cap (CORNER 129);
- (2) S 62°14'10" E a distance of 116.21 feet to a 5/8" rebar set with a CE cap (CORNER 130);
- (3) S 40°12'28" E a distance of 156.28 feet to a 5/8" rebar set with a CE cap (CORNER 131);
- (4) S 53°36'54" E a distance of 272.75 feet to a 5/8" rebar set with a CE cap (CORNER 132);
- (5) S 15°14'21" E a distance of 134.54 feet to a 5/8" rebar set with a CE cap (CORNER 133); said rebar being located in a common line with Deed Book 3502 Page 1633 and Deed Book 7310 Page 3064 of the Guilford County Registry; said rebar also being located N 86°42'32" W a distance of 858.79 feet from an existing 1/2" rebar in the aforesaid common line;

Thence with the aforementioned common line and continuing with the conservation easement area N 86°42'32" W a distance of 141.45 feet to a 5/8" rebar set with a CE cap (CORNER 142); said rebar being located S 86°42'32" E a distance of 235.15 feet from a 5/8" rebar set with a CE cap (CORNER 146);

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (4) courses and distances:

- (1) N 24°56'54" W a distance of 66.12 feet to a 5/8" rebar set with a CE cap (CORNER 143);
- (2) N 51°02'16" W a distance of 397.81 feet to a 5/8" rebar set with a CE cap (CORNER 144);
- (3) S 19°26'17" E a distance of 303.76 feet to a 5/8" rebar set with a CE cap (CORNER 145);

- (4) S 07°40'26" E a distance of 10.25 feet to a 5/8" rebar set with a CE cap (CORNER 146); said rebar being located in a common line with Deed Book 3502 Page 1633 and Deed Book 7310 Page 3064 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°42'32" W a distance of 180.93 feet to a 5/8" rebar set with a CE cap (CORNER 192); said rebar being located S 86°42'32" E a distance of 206.56 feet from a 5/8" rebar set with a CE cap (CORNER 194);

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 25°49'14" W a distance of 142.49 feet to a 5/8" rebar set with a CE cap (CORNER 193);
- (2) S 51°04'42" W a distance of 185.29 feet to a 5/8" rebar set with a CE cap (CORNER 194); said rebar being located in a common line with Deed Book 3502 Page 1633 and Deed Book 7310 Page 3064 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 86°42'32" W a distance of 695.48 feet to an existing 1/2" iron pipe (CORNER 196); said iron pipe being at a common corner of Deed Book 3502 Page 1633 and Deed Book 7310 Page 3064 and in a common line with Deed Book 3554 Page 1365 of the Guilford County Registry, and located N 03°45'50" E a distance of 415.97 feet from an existing 3/4" iron rod in the aforesaid line;

Thence with the common line of Deed Book 3502 Page 1633 and Deed Book 3554 Page 1365 of the Guilford County Registry and continuing with the conservation easement area N 03°45'50" E a distance of 237.14 feet to a 5/8" rebar set with a CE cap (CORNER 197);

Thence leaving the aforesaid common line and continuing with the conservation easement area the following (4) courses and distances:

- (1) S 61°09'23" E a distance of 445.40 feet to a 5/8" rebar set with a CE cap (CORNER 198);
- (2) N 62°17'50" E a distance of 331.87 feet to a 5/8" rebar set with a CE cap (CORNER 199);
- (3) N 35°30'48" E a distance of 265.39 feet to a 5/8" rebar set with a CE cap (CORNER 200);
- (4) N 09°38'45" W a distance of 193.98 feet to a 5/8" rebar set with a CE cap (CORNER 201); said rebar being located in a common line with Deed Book 3502 Page 1633 and Deed Book 3654 Page 306; said rebar also being located S 86°41'49" E a distance of 781.16 feet from an existing plow blade; said plow blade being at a corner of Deed Book 3502 Page 1633, Deed Book 3554 Page 1365 and Deed Book 3654 Page 306 of the Guilford County Registry;

Thence with the common line of Deed Book 3502 Page 1633 and Deed Book 3654 Page 306 of the Guilford County Registry and continuing with the conservation easement area S 86°41'49" E a distance of 162.63 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 7.11 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Joe W. Hopkins and Wife, Lisa Rich Hopkins; Job# 140431-CE; sheet 9. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 3502 PG: 1633 ; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000 ; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEOID: 12A AVERAGE COMBINED FACTOR: .99998597 POSITIONAL ACCURACY: HORIZONTAL: 0.04 UNITS: USFT COURSES USED: NCWC, NCRE, NCGS

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee, L-4647

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16th DAY OF September 2015, PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul Love, Planning Director, 9-16-15

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul Love, Planning Director, 9-16-15

Paul Love, Review Officer for Guilford County, 9-17-15

CERTIFICATE OF OWNERSHIP AND DEDICATION:

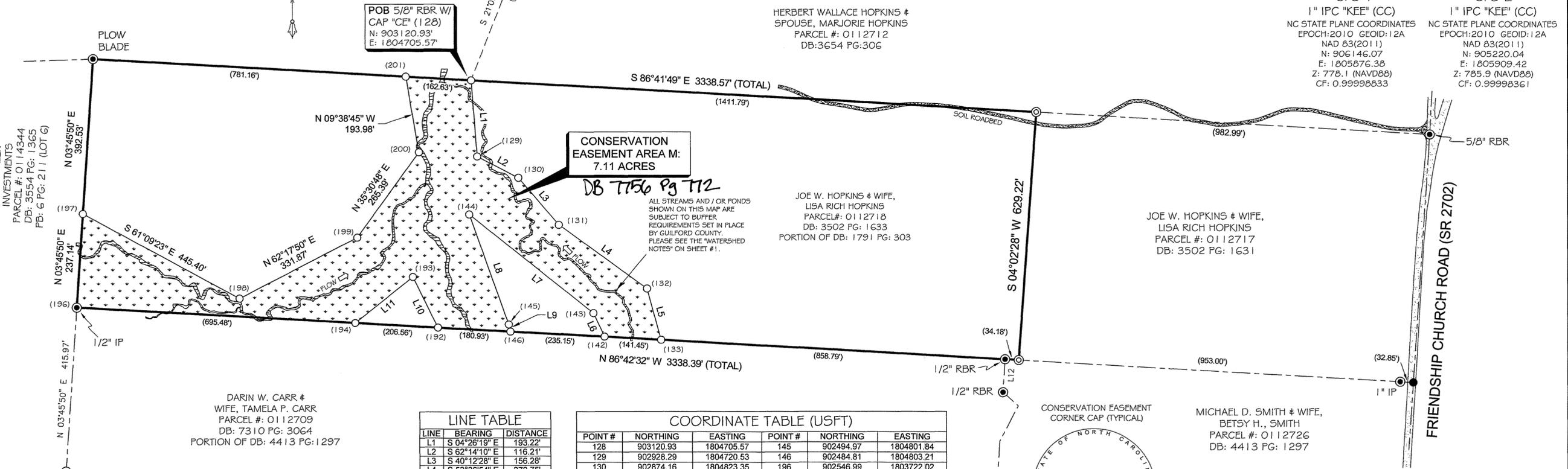
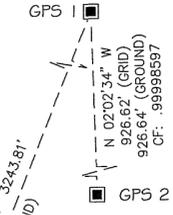
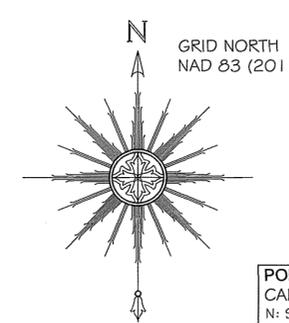
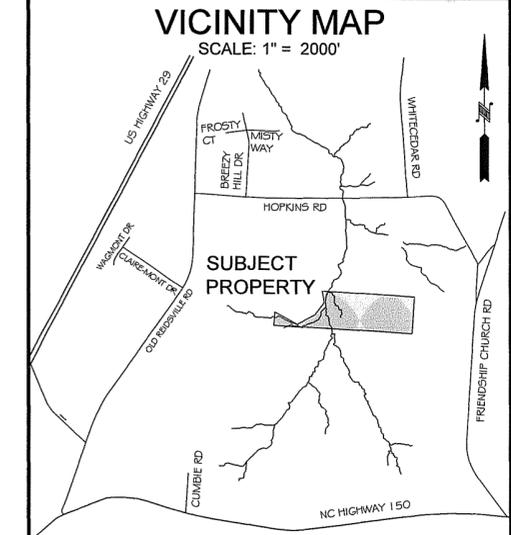
I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Joe W. Hopkins, Lisa Rich Hopkins, 9-11-15

Lisa Rich Hopkins, 9-11-15

Attested by: Jeff L. Thigpen, 9-11-15

BK: P 190 PG: 54-66 REGISTERED 11-03-2015 10:23:40 AM BY MEREDITH A APPLE DEPUTY-GS GUILFORD COUNTY, NC JEFF L. THIGPEN REGISTER OF DEEDS NC FEE \$273.00



GRID TIE INFORMATION table with columns for GPS 1 and GPS 2, including coordinates and factors.

LINE TABLE with columns for Line, Bearing, and Distance.

COORDINATE TABLE (USFT) with columns for Point #, Northing, and Easting.

- SURVEYOR'S NOTES: 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007. 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.

- LEGEND: BOUNDARY LINE, BOUNDARY LINE (NOT SURVEYED), TIE LINE ONLY, ADJOINING DEED LINES, CONSERVATION EASEMENT AREA, ASPHALT, STREAM, CALCULATED POINT, 5/8" RBR SET W/ CE CAP, EXISTING IRON PIN OR REBAR (AS NOTED), 1" IP SET W/ "KEE" CAP, STONE, 1" IRON PIPE W/ "KEE" CAP (CC), NOT TO SCALE (NTS), PLAT BOOK, DEED BOOK, PAGE, REBAR, IRON PIPE, NORTH AMERICAN VERTICAL DATUM, NORTH AMERICAN DATUM 1983, STATE PLANE COORDINATES, CONTROL CORNER, CONSERVATION EASEMENT, COMBINED FACTOR, POINT OF BEGINNING.

EXCLUSION MAP, A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES, "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAE DMS SITE ID: 96315

Keey Mapping & Surveying logo and contact information: P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

BK: R 7756
PG: 959-970
RECORDED:
11-03-2015
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BY: MEREDITH A APPLE
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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$45.00

Excise tax: \$45.00
STATE OF NORTH CAROLINA

plu Isaacson

**DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT**

12M

GUILFORD COUNTY

SPO File Number: 41-AAAEM
DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 24th day of September, 2015, by Robert K. Thacker, ("Grantor"), whose mailing address is PO Box 188, Browns Summit, NC 27214, to the State of North Carolina, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 15.71 acres and

being conveyed to the Grantor by deed as recorded in **Deed Book 5891 at Page 1013** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Area E containing a total of 2.04 **acres** as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Stream Mitigation Site, DMS Site No. 96315, Current Property Owner(s) listed as: Robert K. Thacker," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly

reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

The Grantor reserves the right, for himself, his successors and assigns, to operate motorized vehicles within Crossing Area(s) described on the survey recorded in Plat Book 190, Page 54-66 of the Guilford County Registry as "reserved stream crossing". Said crossing shall not exceed 25 feet in width, and must be maintained and repaired by Grantor, his successors or assigns to prevent degradation of the Conservation Easement Area.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Robert K. Thacker (SEAL)

NORTH CAROLINA
COUNTY OF Guilford

I, Amanda P. Hodierne, a Notary Public in and for the County and State aforesaid, do hereby certify that Robert K. Thacker, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 04th day of September, 2015.

Amanda P. Hodierne
Notary Public

My commission expires:
5-19-20

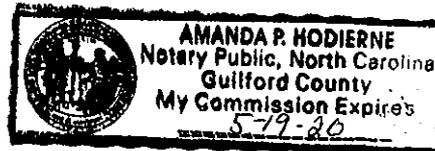


Exhibit A

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

Robert K. Thacker

SPO FILE NUMBER: 41-AAAEM DMS SITE ID: 96315

The following conservation easement area is located off of Hopkins Road within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to Robert K. Thacker through Deed Book 5891 Page 1013 of the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "E":

BEGINNING AT A 5/8" REBAR SET WITH CE CAP (CORNER 21); said rebar being in the common line of Deed Book 5891 Page 1013 and Deed Book 188 Page 532 of the Guilford County Registry, and being the northeast corner of a 25 foot wide reserved stream crossing, and located S 68°57'10" W a horizontal ground distance of 1386.90 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates(2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet;

Thence with the common line of Deed Book 5891 Page 1013 and Deed Book 188 Page 532 of the Guilford County Registry and with the conservation easement area S 00°28'17" E the following (2) distances:

- (1) 62.31 feet to an existing 2" iron pipe;
- (2) 133.85 feet to a 5/8" rebar set with a CE cap (CORNER 48); said rebar being the southeast corner of a 25 foot wide reserved stream crossing, and located N 00°28'17" W a distance of 115.75 feet from an existing 1/2" iron pipe; said iron pipe being in the aforementioned common line;

Thence leaving the aforementioned common line and continuing with the conservation easement area the following (2) courses and distances:

- (1) N 34°49'25" W a distance of 17.58 feet to a 5/8" rebar set with a CE cap (CORNER 49);
- (2) N 59°34'38" W a distance of 17.57 feet to a 5/8" rebar set with a CE cap (CORNER 50); said rebar being the southwest corner of a 25 foot reserved stream crossing;

Thence continuing with the conservation easement area N 59°34'38" W a distance of 552.52 feet to a 5/8" rebar set with a CE cap (CORNER 51); said rebar being located in a common line with Deed Book 5891 Page 1013 and Deed Book 5216 Page 1471 of the Guilford County Registry, and located N 00°25'35" W a distance of 187.79 feet from an existing nail in a root near the edge of a pond in the aforesaid common line;

Thence with the aforementioned common line and continuing with the conservation easement N 00°25'35" W a distance of 30.76 feet to a calculated point witnessed by a 1/2" iron pipe (CORNER 52); said point being at a common corner of Deed Book 6507 Page 2573 and Deed Book 5216 Page 1471, and in a common line with Deed Book 5891 Page 1013 of the Guilford County Registry;

Thence with the common line of Deed Book 5891 Page 1013 and Deed Book 6507 Page 2573 of the Guilford County Registry and continuing with the conservation easement area N 00°25'35" W the following (2) distances:

- (1) 5.22 feet to a 5/8" rebar set with a CE cap (CORNER 53);
- (2) 132.25 feet to a 5/8" rebar set with a CE cap (CORNER 19); said rebar being located S 00°25'35"E a distance of 81.55 feet from an existing 3/4" iron pipe in the aforementioned common line;

Thence leaving the aforementioned common line and continuing with the conservation easement area S 61°14'05" E the following (2) distances:

- (1) 543.20 feet to a 5/8" rebar set with a CE cap (CORNER 20); said rebar being the northwest corner of a 25 foot wide reserved stream crossing;
- (2) 28.65 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 2.04 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of Robert k. Thacker; Job# 140431-CE, sheet 4. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 5891, PG: 1013, THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA
CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C
FIELD PROCEDURE: OPUS
DATES: 06/24/14-07/09/14
DATUM: NAD83(2011) NAVD 88
EPOCH: 2010
GEOID: 12A
AVERAGE COMBINED FACTOR: 9.9998597
POSITIONAL ACCURACY: HORIZONTAL: 0.04
UNITS: USFT
CORS USED: NCWC, NCR, NCGS

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Phillip B. Kee
PHILLIP B. KEE, PLS L-4647

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON THE 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Paul R. Egan
PLANNING DIRECTOR DATE

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Paul R. Egan 9-16-15
PLANNING DIRECTOR DATE

Paul Love REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

Paul Love 9-17-15
REVIEW OFFICER DATE

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

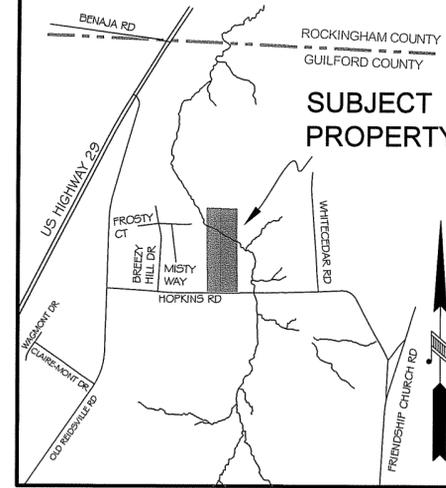
Robert K. Thacker 9-11-15
ROBERT K. THACKER DATE

Attested by: [Signature]
NAME DATE

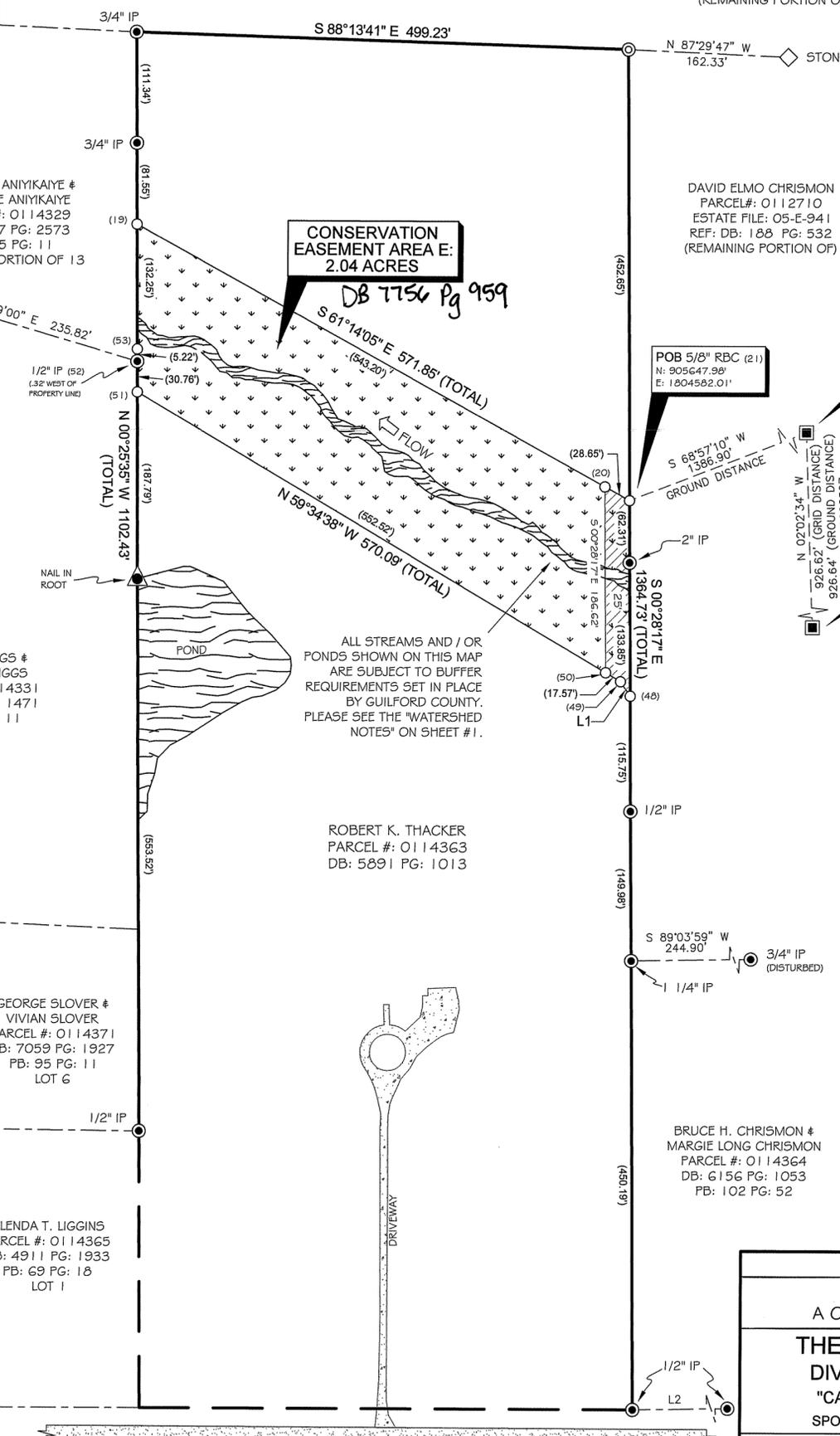
BK: P 190
PG: 54-66
RECORDED: 11-03-2015
10:23:40 AM
BY: MEREDITH AAPLE
DEPUTY-GS
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS
NC FEE \$273.00

JEFFERSON T. HOPKINS & WIFE MARY ANN HOPKINS
PARCEL #: 0114300
DB: 4057 PG: 1613
(REMAINING PORTION OF)

VICINITY MAP
SCALE: 1"=2000'



North arrow pointing to GRID NORTH NAD83 (2011). Scale bar showing 0, 100, 200, 300 feet. Legend for boundary lines, tie lines, fences, easements, asphalt, streams, reserved crossings, and various markers (calculated points, iron pins, stones, control caps, nails, etc.).



CONSERVATION EASEMENT AREA E: 2.04 ACRES
DB 7756 Pg 959

1" IPC "KEE" (CC)
NC STATE PLANE COORDINATES
EPOCH:2010 GEOID:12A
NAD 83(2011)
N: 906146.07'
E: 1805876.38'
Z: 778.1' (NAVD88)
CF: 0.99998833

1" IPC "KEE" (CC)
NC STATE PLANE COORDINATES
EPOCH:2010 GEOID:12A
NAD 83(2011)
N: 905220.04'
E: 1805909.42'
Z: 785.9' (NAVD88)
CF: 0.999988361

- SURVEYOR'S NOTES:
1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
 2. AREAS CALCULATED BY THE COORDINATE METHOD.
 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
 4. GUILFORD COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
 6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
 7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007.
 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
 9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.
 10. ALL STRUCTURES NOT LOCATED WITHIN 100 FEET OF THE CONSERVATION EASEMENT AREA SHOWN ON THIS MAP, HAVE BEEN REMOVED PER GUILFORD COUNTY PLANNING DEPARTMENT REQUIREMENTS.

COORDINATE TABLE (USFT)

POINT #	NORTHING	EASTING
19	905923.17	1804080.74
20	905661.78	1804556.90
21	905647.99	1804582.01
48	905451.83	1804583.63
49	905466.27	1804573.59
50	905475.17	1804558.43
51	905754.95	1804081.99
52	905785.71	1804081.76
53	905790.93	1804081.72

LINE TABLE

LINE	BEARING	DISTANCE
L1	N 34°49'25" W	17.58'
L2	S 89°03'59" W	244.99'

EXCLUSION MAP
A FINAL PLAT OF
A CONSERVATION EASEMENT SURVEY FOR
THE STATE OF NORTH CAROLINA,
DIVISION OF MITIGATION SERVICES
"CANDY CREEK STREAM MITIGATION SITE"
SPO FILE NUMBER: 41-AAAEM DMS SITE ID: 96315
PARCEL NUMBER: 0114363
CURRENT OWNER(S) LISTED AS:
ROBERT K. THACKER
MAILING ADDRESS: P.O. BOX 188, BROWNS SUMMIT, NC 27214
PHONE NUMBER(S): (336)-908-7238
DEED REFERENCE: BOOK: 5891 PAGE: 1013
MADISON TOWNSHIP, GUILFORD COUNTY, NORTH CAROLINA
SURVEY BY: DD,KP,NC DRAWN BY: NH CHECKED BY: PBK
SURVEY DATE: 06/24/14-04/10/15 JOB #140431-CE
SHEET SIZE: 18"x24" SHEET #: 4 OF 13 SCALE: 1"=100'
Kee MAPPING & SURVEYING
P.O. Box 2566
Asheville, NC 28802
(828) 575-9021
www.keemap.com
License # C-3039

BK: R 7756
PG: 893-905
RECORDED:
11-03-2015
11:36:43 AM
BY: MEREDITH APPLE
DEPUTY-GB



2015059099

GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE \$26.00
STATE OF NC
REAL ESTATE
EXTX \$3.00

Excise Tax: \$3.00

STATE OF NORTH CAROLINA

du Isaacson

DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED
PURSUANT TO
FULL DELIVERY
MITIGATION CONTRACT

GUILFORD COUNTY

B^m

SPO File Number: 41-AAAEN
DMS Project Number: 96315

Prepared by: Office of the Attorney General
Property Control Section
~~Return to:~~ NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th day of October, 2015, by David G. Wagoner Sr. and wife, Theresa R. Wagoner, (“Grantor”), whose mailing address is 3709 April Lane, Greensboro NC 27405, to the State of North Carolina, (“Grantee”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that

contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 5 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 3728 at Page 1496** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas S containing 0.80 **acres** respectively as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: David G. Wagoner Sr," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190** Pages 54-66.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservation easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

David G. Wagoner Sr. (SEAL)
DAVID G. WAGONER, Sr.

Theresa R. Wagoner (SEAL)
THERESA R. WAGONER

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that David G. Wagoner, Sr.*, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27TH day of October, 2015.

** and Theresa R. Wagoner*

Kathy M. Hendrix
Notary Public

My commission expires:
11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

David Gordon Wagoner, Sr.

SPO FILE NUMBER: 41-AAAEN DMS SITE ID: 96315

The following conservation easement area is located off of NC HWY 150 within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to David Gordon Wagoner, Sr. through Estate File: 09-E-1998 (Deed Book 3728 Page 1496, Deed Book 7729 Page 699 and Deed Book 3222 Page 646) in the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "T":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 175), said rebar being in the common line of Deed Book 3222 Page 646 and Deed Book 1826 Page 75 of the Guilford County Registry; and being located S 13°16'03" W a horizontal ground distance of 5210.39 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; said rebar also being located N 86°01'57" W a distance of 417.00 feet from an existing 3/4" iron pipe; said iron pipe being at a common corner of Deed Book 3222 Page 646 and Deed Book 4552 Page 2029 and in the common line with Deed Book 1826 Page 75;

Thence leaving the aforesaid common line and with the conservation easement area the following (3) courses and distances:

- (1) S 02°59'22" E a distance of 225.65 feet to a 5/8" rebar set with a CE cap (CORNER 176);
- (2) S 20°08'39" W a distance of 120.19 feet to a 5/8" rebar set with a CE cap (CORNER 177);
- (3) N 83°09'12" W a distance of 13.52 feet to a 5/8" rebar set with a CE cap (CORNER 178); said rebar being located in the common line with Deed Book 3222 Page 646 and Deed Book 3728 Page 1496 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 03°56'21" E a distance of 338.74 feet to a calculated point; said calculated point being the common corner of Deed Book 3222 Page 646 and Deed Book 7729 Page 699 and in the common line with Deed Book 1826 Page 75 of the Guilford County Registry; said rebar also being located S 86°01'57" E a distance of 170.04 feet from a 5/8" rebar set with a CE cap (CORNER 181);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°01'57" E a distance of 19.82 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.25 Acres, being the same more or less.

Conservation Easement Area "S":

BEGINNING AT A CALCULATED POINT, said calculated point being a common corner of Deed Book 3222 Page 646 and Deed Book 7729 Page 699 and in the common line with Deed Book 1826 Page 75 of the Guilford County Registry; and being located N 86°01'57" W a distance of 19.82 feet from a 5/8" rebar set with a CE cap (CORNER 175);

Thence leaving the aforesaid common corner and with the common line of Deed Book 3728 Page 1496 and Deed Book 3222 Page 646 of the Guilford County Registry and continuing with the conservation easement area S 03°56'21" W a distance of 338.74 feet to a 5/8" rebar set with a CE cap (CORNER 178); said rebar being located N 83°09'12" W a distance of 13.52 feet from a 5/8" rebar set with a CE cap (CORNER 177);

Thence leaving the aforesaid common line and continuing with the conservation easement area the following (3) courses and distances:

- (1) N 83°09'12" W a distance of 85.92 feet to a 5/8" rebar set with a CE cap (CORNER 179);
- (2) N 03°11'47" E a distance of 202.88 feet to a 5/8" rebar set with a CE cap (CORNER 180);
- (3) N 27°51'38" W a distance of 154.85 feet to a 5/8" rebar set with a CE cap (CORNER 181); said rebar being located in the common line of Deed Book 7729 Page 699 and Deed Book 1826 Page 75 of the Guilford County Registry; said rebar also being located S 86°01'57" E a distance of 270.62 feet from an existing stone; said stone being at a common corner of Deed Book 1826 Page 75, Deed Book 3728 Page 1496 and Deed Book 7729 Page 699 and in the common line with Deed Book 7217 Page 2553;

Thence with the aforesaid common line and continuing with the conservation easement area S 86°01'57" E a distance of 170.04 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.80 Acres, being the same more or less.

Being all of that area of land containing a total of 1.05 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of David Gordon Wagoner, Sr.; Job# 140431-CE, Sheet 12. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

BK: R 7756

PG: 879-892

RECORDED:

11-03-2015

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BY: MEREDITH AAPPLE

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2015059098

GUILFORD COUNTY, NC

JEFF L. THIGPEN

REGISTER OF DEEDS

NC FEE \$26.00

STATE OF NC

REAL ESTATE

EXTX \$8.00

Excise Tax: \$8.00

STATE OF NORTH CAROLINA

DEED OF CONSERVATION EASEMENT
AND RIGHT OF ACCESS PROVIDED

PURSUANT TO
FULL DELIVERY

MITIGATION CONTRACT

AD
plu Isaacson

GUILFORD COUNTY

SPO File Number: 41-AAAEN

DMS Project Number: 96315

Prepared by: Office of the Attorney General

Property Control Section

~~Return to:~~ NC Department of Administration

State Property Office

1321 Mail Service Center

Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 27th-day of October, 2015, by David G. Wagoner Sr. and wife Theresa R. Wagoner, David G. Wagoner Jr and wife, Heather W. Wagoner, and Brian Porter Wagoner and wife, Brandy M. Wagoner, (“Grantor”), whose mailing address is 3709 April Lane, Greensboro NC 27405, to the State of North Carolina, (“Grantee”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Division of Mitigation Services (formerly known as the Ecosystem Enhancement Program and formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring,

maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Wildlands Engineering, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 5794.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Ecosystem Enhancement Program with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Division of Mitigation Services in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Madison Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 15.15 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 3222 at Page 646** of the Guilford County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Candy Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

The Conservation Easement Area consists of the following:

Conservation Easement Areas T containing 0.25 acres as shown on the plats of survey entitled "Final Plat, Conservation Easement for The State of North Carolina Division of Mitigation Services, Candy Creek Mitigation Site, DMS Site No. 96315, Current Owner(s) Listed As: David G. Wagoner Sr," dated Sept 10, 2015 by Phillip Kee, PLS Number 4647 and recorded in the Guilford County, North Carolina Register of Deeds at **Plat Book 190 Pages 54-66**.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

The purposes of this Conservation Easement are to maintain, restore, enhance, construct, create and preserve wetland and/or riparian resources in the Conservation Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Conservation Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

The Conservation Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Conservation Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

B. Motorized Vehicle Use. Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat or as specifically allowed within a fence maintenance zone as described in section D or a Road or Trail described in section H.

C. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

D. Damage to Vegetation. Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited with the following exception:

E. Industrial, Residential and Commercial Uses. All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

F. Agricultural Use. All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.

G. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.

H. Roads and Trails. There shall be no construction or maintenance of roads, trails, walkways, or paving in the Conservation Easement Area with the following exception:

Only roads and trails located within the Conservation Easement Area prior to completion of the construction of the restoration project and within crossings shown on the recorded survey plat may be maintained by Grantor, successors or assigns to allow for access to the interior of the Property, and must be repaired and maintained to prevent runoff and degradation to the Conservation Easement Area. Such roads and trails shall be covered with pervious materials such as loose gravel or permanent vegetation in order to minimize runoff and prevent sedimentation.

All roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

I. Signs. No signs shall be permitted in the Conservation Easement Area except interpretive signs describing restoration activities and the conservation values of the Conservation Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Conservation Easement Area.

J. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances, machinery, or any other material in the Conservation Easement Area is prohibited.

K. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, drilling, hydraulic fracturing; removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

L. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water in the Conservation Easement Area. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns is allowed. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides in the Conservation Easement Area is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Conservation Easement Area may temporarily be withdrawn for good cause shown as needed for the survival of livestock on the Property.

M. Subdivision and Conveyance. Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

N. Development Rights. All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

O. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Conservation Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the N.C. Division of Mitigation Services, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterranean water flow.

C. Signs. The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

E. Crossing Area(s). The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair

crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Conservation Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief, if the breach is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement, and the Grantor and Grantee acknowledge that the damage would be irreparable and remedies at law inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Conservation Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor is complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor for any injury or change in the Conservation Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life or damage to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring expenses, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

E. No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

D. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees that any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed is subject to the Conservation Easement herein created.

E. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

and

General Counsel
US Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403

G. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Conservation Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Conservation Easement Area, and the right of quiet enjoyment of the Conservation Easement Area,

TO HAVE AND TO HOLD, the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes,

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same is free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

David G. Wagoner Sr. (SEAL)
David G. Wagoner, Sr.

Theresa R. Wagoner by David G. Wagoner Sr. her attorney in fact (SEAL)
Theresa R. Wagoner by David G. Wagoner, Sr., her attorney in fact

David Gordon Wagoner, Jr. by David G. Wagoner Sr. his attorney in fact (SEAL)
David Gordon Wagoner, Jr. by David G. Wagoner, Sr., his attorney in fact

Heather W. Wagoner by David G. Wagoner Sr. her attorney in fact (SEAL)
Heather W. Wagoner by David G. Wagoner, Sr. her attorney in fact

Brian Porter Wagoner by David G. Wagoner Sr. his attorney in fact (SEAL)
Brian Porter Wagoner by David G. Wagoner, Sr., his attorney in fact

Brandy M. Wagoner by David G. Wagoner Sr. her attorney in fact (SEAL)
Brandy M. Wagoner by David G. Wagoner, Sr., her attorney in fact

**NORTH CAROLINA
COUNTY OF GUILFORD**

I, Kathy M. Hendrix, a Notary Public in and for the County and State aforesaid, do hereby certify that David G. Wagoner, Sr., Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 27TH day of October, 2015.

Kathy M. Hendrix
Notary Public

My commission expires:
11/29/18



**STATE OF NORTH CAROLINA
COUNTY OF GUILFORD**

I, the undersigned, a Notary Public, do hereby certify that DAVID G. WAGONER, SR., Attorney in Fact for THERESA R. WAGONER, DAVID GORDON WAGONER, JR., HEATHER W. WAGONER, BRIAN PORTER WAGONER and BRANDY M. WAGONER, personally appeared before me this day and being by me duly sworn says that he executed the foregoing and annexed instrument for and in behalf of THERESA R. WAGONER, DAVID GORDON WAGONER, JR., HEATHER W. WAGONER, BRIAN PORTER WAGONER and BRANDY M. WAGONER and that his authority to execute and acknowledge said instrument is contained in an instrument duly executed, acknowledged and recorded in the Office of the Register of Deeds of Guilford County, North Carolina in Book 7756 Page 872, and that this instrument was executed under and by virtue of the authority given by said instrument granting DAVID G. WAGONER, SR. power of attorney and that the said DAVID G. WAGONER, SR. acknowledged the due execution of the foregoing and annexed instrument for the purposes therein expressed for and in behalf of the said THERESA R. WAGONER, DAVID GORDON WAGONER, JR., HEATHER W. WAGONER, BRIAN PORTER WAGONER and BRANDY M. WAGONER.

WITNESS my hand and official seal this the 27th day of October, 2015.

Kathy M. Hendrix
Notary Public
My commission expires: 11/29/18



Exhibit A

[SEE ATTACHED PAGES]

Exhibit A:

*A Conservation Easement for
The State of North Carolina,
Division of Mitigation Services,
"Candy Creek Stream Mitigation Site"*

Property of:

David Gordon Wagoner, Sr.

SPO FILE NUMBER: 41-AAAEN DMS SITE ID: 96315

The following conservation easement area is located off of NC HWY 150 within the Madison Township, Guilford County, North Carolina and being on a portion of that property conveyed to David Gordon Wagoner, Sr. through Estate File: 09-E-1998 (Deed Book 3728 Page 1496, Deed Book 7729 Page 699 and Deed Book 3222 Page 646) in the Guilford County Register of Deeds and being more particularly described as follows:

Conservation Easement Area "T":

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 175), said rebar being in the common line of Deed Book 3222 Page 646 and Deed Book 1826 Page 75 of the Guilford County Registry; and being located S 13°16'03" W a horizontal ground distance of 5210.39 feet from a 1" iron pipe set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 906146.07 feet and Easting: 1805876.38 feet; said rebar also being located N 86°01'57" W a distance of 417.00 feet from an existing 3/4" iron pipe; said iron pipe being at a common corner of Deed Book 3222 Page 646 and Deed Book 4552 Page 2029 and in the common line with Deed Book 1826 Page 75;

Thence leaving the aforesaid common line and with the conservation easement area the following (3) courses and distances:

- (1) S 02°59'22" E a distance of 225.65 feet to a 5/8" rebar set with a CE cap (CORNER 176);
- (2) S 20°08'39" W a distance of 120.19 feet to a 5/8" rebar set with a CE cap (CORNER 177);
- (3) N 83°09'12" W a distance of 13.52 feet to a 5/8" rebar set with a CE cap (CORNER 178); said rebar being located in the common line with Deed Book 3222 Page 646 and Deed Book 3728 Page 1496 of the Guilford County Registry;

Thence with the aforesaid common line and continuing with the conservation easement area N 03°56'21" E a distance of 338.74 feet to a calculated point; said calculated point being the common corner of Deed Book 3222 Page 646 and Deed Book 7729 Page 699 and in the common line with Deed Book 1826 Page 75 of the Guilford County Registry; said rebar also being located S 86°01'57" E a distance of 170.04 feet from a 5/8" rebar set with a CE cap (CORNER 181);

Thence with the aforesaid common line and continuing with the conservation easement area S 86°01'57" E a distance of 19.82 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.25 Acres, being the same more or less.

Conservation Easement Area "S":

BEGINNING AT A CALCULATED POINT, said calculated point being a common corner of Deed Book 3222 Page 646 and Deed Book 7729 Page 699 and in the common line with Deed Book 1826 Page 75 of the Guilford County Registry; and being located N 86°01'57" W a distance of 19.82 feet from a 5/8" rebar set with a CE cap (CORNER 175);

Thence leaving the aforesaid common corner and with the common line of Deed Book 3728 Page 1496 and Deed Book 3222 Page 646 of the Guilford County Registry and continuing with the conservation easement area S 03°56'21" W a distance of 338.74 feet to a 5/8" rebar set with a CE cap (CORNER 178); said rebar being located N 83°09'12" W a distance of 13.52 feet from a 5/8" rebar set with a CE cap (CORNER 177);

Thence leaving the aforesaid common line and continuing with the conservation easement area the following (3) courses and distances:

- (1) N 83°09'12" W a distance of 85.92 feet to a 5/8" rebar set with a CE cap (CORNER 179);
- (2) N 03°11'47" E a distance of 202.88 feet to a 5/8" rebar set with a CE cap (CORNER 180);
- (3) N 27°51'38" W a distance of 154.85 feet to a 5/8" rebar set with a CE cap (CORNER 181); said rebar being located in the common line of Deed Book 7729 Page 699 and Deed Book 1826 Page 75 of the Guilford County Registry; said rebar also being located S 86°01'57" E a distance of 270.62 feet from an existing stone; said stone being at a common corner of Deed Book 1826 Page 75, Deed Book 3728 Page 1496 and Deed Book 7729 Page 699 and in the common line with Deed Book 7217 Page 2553;

Thence with the aforesaid common line and continuing with the conservation easement area S 86°01'57" E a distance of 170.04 feet to the TRUE POINT OF BEGINNING.

Being all of that area of land containing a total of 0.80 Acres, being the same more or less.

Being all of that area of land containing a total of 1.05 Acres, being the same more or less, according to a plat of survey entitled "A Conservation Easement Survey for: The State of North Carolina, Division of Mitigation Services, Candy Creek Stream Mitigation Site"; on the property of David Gordon Wagoner, Sr.; Job# 140431-CE, Sheet 12. This description was prepared from an actual survey and shown on the aforementioned plat by Kee Mapping and Surveying, PA (License # C-3039) between the dates of 06/24/14 – 04/10/15 and under the supervision of Phillip B. Kee, NC PLS (License # L-4647).

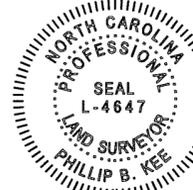
CERTIFICATE OF SURVEY AND ACCURACY:

I, PHILLIP B. KEE, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 3728, PG: 1496 AND DB: 3222, PG: 646...

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A VERTICAL: C FIELD PROCEDURE: OPUS DATES: 06/24/14-07/09/14 DATUM: NAD83(2011) NAVD 88 EPOCH: 2010 GEIOD: 12A...

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(11) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 10TH DAY OF SEPTEMBER, 2015, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Signature of Phillip B. Kee, Land Surveyor, No. L-4647.

GUILFORD COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN GUILFORD COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

APPROVED BY THE PLANNING DEPARTMENT OF GUILFORD COUNTY, NORTH CAROLINA ON 16 DAY OF September 2015 PURSUANT TO ARTICLE V OF THE GUILFORD COUNTY DEVELOPMENT ORDINANCE.

Signature of Phillip B. Kee, Planning Director, dated 9-16-15.

THIS PLAT DOES NOT REQUIRE A CERTIFICATE OF APPROVAL BY THE DIVISION OF HIGHWAYS AS PROVIDED IN N.C.G.S. 136-102.6, SUBSECTION (G).

Signature of Phillip B. Kee, Planning Director, dated 9-16-15.

I, Paul Love, REVIEW OFFICER FOR GUILFORD COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED, MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

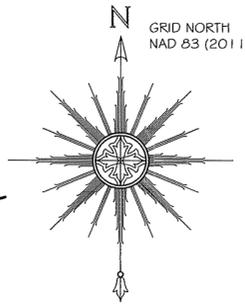
Signature of Paul Love, Review Officer, dated 9-17-15.

CERTIFICATE OF OWNERSHIP AND DEDICATION:

I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORD PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATED ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON THIS PLAT.

Signatures of David Gordon Wagoner, Sr. (9-15-15), Theresa R. Wagoner (9-15-15), David Gordon Wagoner, Jr. (9-15-15), Heather W. Wagoner (9-15-15), Brian Porter Wagoner (9-15-15), and Brandy M. Wagoner (9-15-15).

Attested by: Phillip B. Kee, dated 9-15-15.



CONSERVATION EASEMENT CORNER-NC CAP (TYPICAL)

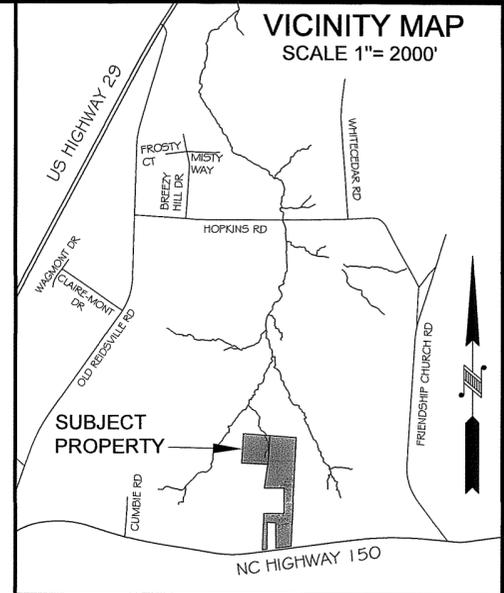
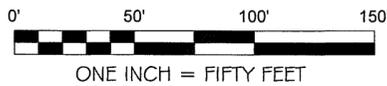


Table with 3 columns: POINT #, NORTHING, EASTING. Lists coordinates for points 175 through 181.



ONE INCH = FIFTY FEET

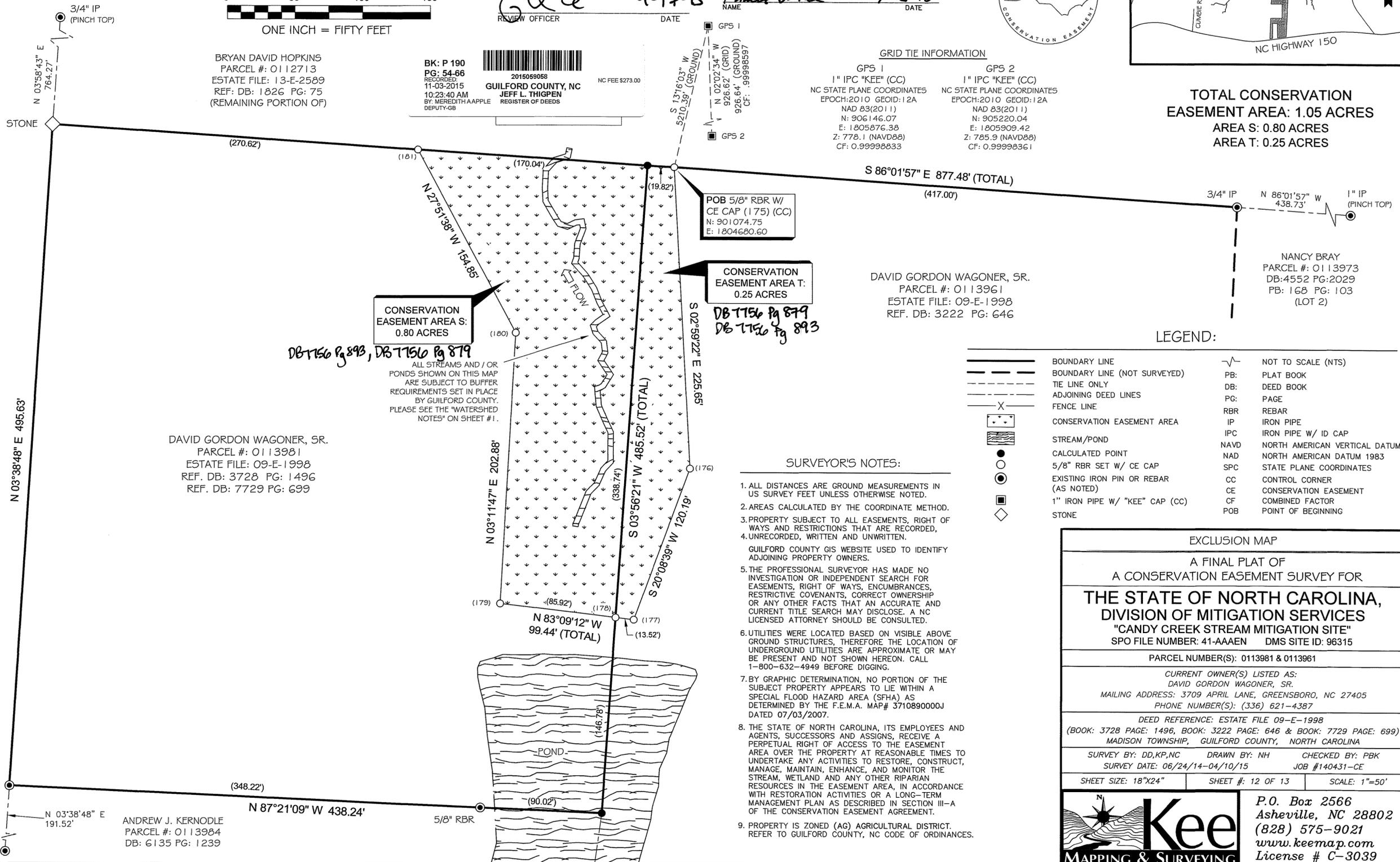
BRYAN DAVID HOPKINS PARCEL #: 0112713 ESTATE FILE: 13-E-2509 REF: DB: 1826 PG: 75 (REMAINING PORTION OF)

BK: P 190 PG: 54-66 RECORDED 11-03-2015 10:23:40 AM BY MEREDITH A APPLE DEPUTY-GS GUILFORD COUNTY, NC JEFF L. THIGPEN REGISTER OF DEEDS NC FEE \$273.00

GPS 1 N 02°02'34" W 926.62' (GRID) 926.64' (GROUND) CF: .99998597

Grid Tie Information table with columns for GPS 1 and GPS 2, listing coordinates and conversion factors.

TOTAL CONSERVATION EASEMENT AREA: 1.05 ACRES AREA S: 0.80 ACRES AREA T: 0.25 ACRES



ANDREW JENNINGS KERNODLE PARCEL #: 0113962 DB: 7217 PG: 2553

DAVID GORDON WAGONER, SR. PARCEL #: 0113981 ESTATE FILE: 09-E-1998 REF. DB: 3728 PG: 1496 REF. DB: 7729 PG: 699

DAVID GORDON WAGONER, SR. PARCEL #: 0113961 ESTATE FILE: 09-E-1998 REF. DB: 3222 PG: 646

NANCY BRAY PARCEL #: 0113973 DB: 4552 PG: 2029 PB: 168 PG: 103 (LOT 2)

Legend table defining symbols for boundary lines, easement areas, streams, ponds, and other features.

SURVEYOR'S NOTES:

- 1. ALL DISTANCES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, 4. UNRECORDED, WRITTEN AND UNWRITTEN.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.
6. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES, THEREFORE THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON.
7. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP# 3710890000J DATED 07/03/2007.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
9. PROPERTY IS ZONED (AG) AGRICULTURAL DISTRICT. REFER TO GUILFORD COUNTY, NC CODE OF ORDINANCES.

EXCLUSION MAP: A FINAL PLAT OF A CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, DIVISION OF MITIGATION SERVICES "CANDY CREEK STREAM MITIGATION SITE" SPO FILE NUMBER: 41-AAAEN DMS SITE ID: 96315. Includes owner information and survey details.



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Appendix 2: Historic Aerial Photographs



INQUIRY #: 3754297.1

YEAR: 1949

 = 1000'





INQUIRY #: 3754297.1

YEAR: 1971

|—————| = 750'



177 - 55

INQUIRY #: 3754297.1

YEAR: 1977

| = 750'





INQUIRY #: 3754297.1

YEAR: 1988



 = 1000'



INQUIRY #: 3754297.1

YEAR: 2006

 = 500'





INQUIRY #: 3754297.1

YEAR: 2010

 = 500'



**Appendix 3: Project Site USACE Routine
Wetland Determination Data Forms
Jurisdictional Determination**

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland A - DP1
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.243609 Long: W 79.664027 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland A - DP1
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30' _____)				Dominance Test worksheet:
1. <u>Liriodendron tulipifera</u>	15	Yes	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Liquidambar styraciflua</u>	15	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>Fraxinus pennsylvanica</u>	10	Yes	FACW	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
40 = Total Cover				
Sapling/Shrub Stratum (Plot size: 15' _____)				
1. <u>Cercis canadensis</u>	5	Yes	FACU	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
5 = Total Cover				
Herb Stratum (Plot size: 5' _____)				
1. <u>Commelina communis</u>	70	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polygonum pensylvanicum</u>	20	Yes	FACW	
3. <u>Microstegium vimineum</u>	8	No	FAC	
4. <u>Xanthium strumarium</u>	2	No	FAC	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
100 = Total Cover				
Woody Vine Stratum (Plot size: 30' _____)				
1. _____	_____	_____	_____	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland A - DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 5/2	85	10YR 4/6	15	C	PL	loam	
3-12	10YR 4/2	90	5YR 3/4	10	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland A- DP2
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.243534 Long: W 79.664104 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

SOIL

Sampling Point: Upland A- DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	2.5Y 5/3	100					loam	
3-12	2.5Y 6/4	90	7.5YR 7/6	10	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland B - DP3
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.243235 Long: W 79.664409 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland B - DP3
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Polygonum pensylvanicum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Dichanthelium clandestinum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Boehmeria cylindrica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland B - DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10 YR 4/3	100					loam	
4-12	10 YR 4/1	90	10YR 4/6	10	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland B- DP4
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.243241 Long: W 79.664334 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland B- DP4

	Absolute % Cover	Dominant Species?	Indicator Status			
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:		
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)		
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)		
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)		
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>75</u> x 3 = <u>225</u> FACU species <u>25</u> x 4 = <u>100</u> UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>325</u> (B) Prevalence Index = B/A = <u>3.25</u>		
5. _____	_____	_____	_____			
6. _____	_____	_____	_____			
7. _____	_____	_____	_____			
8. _____	_____	_____	_____			
_____ = Total Cover						
Sapling/Shrub Stratum (Plot size: <u>15'</u>)						
1. _____	_____	_____	_____			
2. _____	_____	_____	_____			
3. _____	_____	_____	_____			
4. _____	_____	_____	_____			
5. _____	_____	_____	_____			
6. _____	_____	_____	_____			
7. _____	_____	_____	_____			
8. _____	_____	_____	_____			
9. _____	_____	_____	_____			
10. _____	_____	_____	_____			
_____ = Total Cover						
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.		
1. <u>Festuca sp.</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>			
2. <u>Xanthium strumarium</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>			
3. <u>Trifolium repens</u>	<u>15</u>	<u>No</u>	<u>FACU</u>			
4. <u>Eupatorium capillifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>			
5. _____	_____	_____	_____			
6. _____	_____	_____	_____			
7. _____	_____	_____	_____			
8. _____	_____	_____	_____			
9. _____	_____	_____	_____			
10. _____	_____	_____	_____			
11. _____	_____	_____	_____			
12. _____	_____	_____	_____			
_____ = Total Cover						
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.		
1. _____	_____	_____	_____			
2. _____	_____	_____	_____			
3. _____	_____	_____	_____			
4. _____	_____	_____	_____			
5. _____	_____	_____	_____			
6. _____	_____	_____	_____			
_____ = Total Cover						
<table style="width:100%; border: none;"> <tr> <td style="width:60%;">Hydrophytic Vegetation Present?</td> <td style="width:20%; text-align: center;">Yes _____</td> <td style="width:20%; text-align: center;">No <input checked="" type="checkbox"/></td> </tr> </table>				Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>
Hydrophytic Vegetation Present?	Yes _____	No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)						

SOIL

Sampling Point: Upland B- DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/3	100					loam	
3-12	10YR 6/6	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland C - DP5
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.242960 Long: W 79.664921 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Majority of trees and saplings have been removed. Wetland is directly connected to Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) <input checked="" type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland C - DP5
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: 15')				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: 5')				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Juncus effusus</u>	40	Yes	FACW	
2. <u>Commelina communis</u>	35	Yes	FAC	
3. <u>Polygonum pennsylvanica</u>	20	Yes	FACW	
4. <u>Eleocharis sp.</u>	5	No	FACW	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
100 = Total Cover				
Woody Vine Stratum (Plot size: 30')				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland C- DP6
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.243020 Long: W 79.664961 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland C- DP6

<u>Tree Stratum</u> (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5'</u>)				
1. <u>Festuca sp.</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Trifolium repens</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Eupatorium capillifolium</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Upland C- DP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/4	100					sandy loam	
4-12	10YR 4/6	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland D - DP7
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.242800 Long: W 79.665999 Datum: _____
 Soil Map Unit Name: Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland D - DP7
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. <u>Salix nigra</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Acer rubrum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>35</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Carpinus caroliniana</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>10</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Commelina communis</u>	<u>60</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Microstegium vimineum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Polygonum pennsylvanica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
4. <u>Boehmeria cylindrica</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: Wetland D - DP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	80	10YR 3/6	20	C	PL	loam	
4-9	10YR 4/2	80	5YR 3/4	20	C	PL	loam	
9-12	10YR 4/1	95	5YR 4/6	5	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland D- DP8
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.242701 Long: W 79.665979 Datum: _____
 Soil Map Unit Name: Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland D- DP8

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
1. <u>Salix nigra</u>	<u>15</u>	<u>Yes</u>	<u>OBL</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____	_____	_____	_____		
<u>15</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>		
2. <u>Polygonum pensylvanicum</u>	<u>5</u>	<u>No</u>	<u>FACW</u>		
3. <u>Xanthium strumarium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>		
4. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>		
5. <u>Dichanthelium clandestinum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					
.					

SOIL

Sampling Point: Upland D- DP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	2.5Y 5/3	100					loam	
2-12	10YR 4/3	90	7.5YR 4/6	10	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland E - DP9
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.241927 Long: W 79.665717 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near hillslope in actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland E - DP9
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: 30')				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)	
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: 15')					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: 5')					
1. Polygonum pennsylvanica	70	Yes	FACW		
2. Juncus effusus	15	No	FACW		
3. Eleocharis sp.	10	No	OBL		
4. Xanthium strumarium	2.5	No	FAC		
5. Solanum carolinense	2.5	No	FACU		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
100 _____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: 30')					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland E & F- DP10
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.241398 Long: W 79.665728 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located at bottom of hillslope in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Upland E & F- DP10
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Festuca sp.</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Solanum carolinense</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	
3. <u>Eupatorium capillifolium</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
.				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland F - DP11
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.241143 Long: W 79.665816 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) <input checked="" type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland F - DP11
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Commelina communis</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Eleocharis sp.</u>	<u>35</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Juncus effusus</u>	<u>15</u>	<u>No</u>	<u>FACW</u>	
4. <u>Polygonum pennsylvanica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland F - DP11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	2.5Y 5/2	90	7.5YR 5/8	10	C	PL	loam	
4-12	10YR 4/2	85	7.5YR 4/6	15	C	PL	silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland G - DP12
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.240734 Long: W 79.665978 Datum: _____
 Soil Map Unit Name: Codorus Loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in right floodplain of Candy Creek in actively grazed pasture. Majority of trees and saplings have been removed. The feature is an old pond bed that drains into Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) _____ Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland G - DP12
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: 15')				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: 5')				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Polygonum pennsylvanica</u>	80	Yes	FACW	
2. <u>Microstegium vimineum</u>	10	No	FAC	
3. <u>Dichanthelium clandestinum</u>	5	No	FAC	
4. <u>Juncus effusus</u>	5	No	FACW	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
100 = Total Cover				
Woody Vine Stratum (Plot size: 30')				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland G- DP13
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.240397 Long: W 79.666128 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near right top of bank of Candy Creek in an actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland G- DP13

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Salix nigra</u>	<u>25</u>	<u>Yes</u>	<u>OBL</u>	
2. <u>Platanus occidentalis</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Ulmus americana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Microstegium vimineum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>90</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.) .				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland H - DP14
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.240097 Long: W 79.666426 Datum: _____
 Soil Map Unit Name: Poplar Forest Sandy Loam(PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in left floodplain of Candy Creek. The area drains from offsite and is impacted by cattle presence.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland H - DP14
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____	_____	_____	_____	
<u>80</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Acer rubrum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>20</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Impatiens capensis</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Microstegium vimineum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Sagittaria latifolia</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	
4. <u>Symplocarpus foetidus</u>	<u>5</u>	<u>No</u>	<u>OBL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland H - DP14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	2.5Y 3/2	100					silt	
7-12	2.5Y 3/1	98	10YR 4/6	2	C	PL	silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Stripped Matrix (S6)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland H - DP15
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.240120 Long: W 79.666313 Datum: _____
 Soil Map Unit Name: Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near left top of bank of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland H - DP15

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Platanus occidentalis</u>	30	Yes	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)	
2. <u>Acer rubrum</u>	20	Yes	FAC		
3. <u>Gleditsia triacanthos</u>	15	Yes	FAC		
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
65 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. <u>Ailanthus altissima</u>	5	Yes	FACU		
2. <u>Juniperus virginiana</u>	5	Yes	FACU		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
10 = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	45	Yes	FAC		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
45 = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					
.					

SOIL

Sampling Point: Upland H - DP15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	2.5Y 4/4	100					sandy loam	
4-12	2.5Y 8/4	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/12/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland - DP16
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.239831 Long: W 79.665945 Datum: _____
 Soil Map Unit Name: Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in right floodplain of Candy Creek in an actively grazed pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland - DP16

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Polygonum pennsylvanicum</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Juncus effusus</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Carex sp.</u>	<u>20</u>	<u>Yes</u>	<u>UNKNOWN</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
.				

SOIL

Sampling Point: Upland - DP16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	2.5Y 3/2	100					loam	
2-12	2.5Y 4/3	85	7.5 YR 5/8	15	C	PL	sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Stripped Matrix (S6)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland I - DP17
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.238963 Long: W 79.665251 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in right floodplain of Candy Creek in actively grazed pasture. Trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) <input checked="" type="checkbox"/> Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland I - DP17
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Sapling/Shrub Stratum (Plot size: 15')				
1. <i>Betula nigra</i>	2	Yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: 5')				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <i>Juncus effusus</i>	50	Yes	FACW	
2. <i>Polygonum pennsylvanicum</i>	25	Yes	FACW	
3. <i>Eleocharis</i> sp.	15	No	OBL	
4. <i>Commelina communis</i>	10	No	FAC	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: 30')				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland I - DP17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	2.5YR 4/2	90	7.5 YR 4/6	10	C	PL	loam	
5-12	2.5YR 4/2	85	7.5 YR 4/6	15	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland I - DP18
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.238662 Long: W 79.665226 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in an actively grazed pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Upland I - DP18
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>FAC</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Fescuta sp.</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Solanum carolinense</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. <u>Amaranthus spinosus</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
.				

SOIL

Sampling Point: Upland I - DP18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	7.5 YR 4/3	100					loam	
4-6	2.5 YR 7/4	100					sandy loam	
6-12	2.5 YR 4/4	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland K - DP19
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237840 Long: W 79.664576 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in right floodplain of Candy Creek in actively grazed pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland K - DP19
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Commelina communis</u>	<u>85</u>	<u>Yes</u>	<u>FAC</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polygonum pennsylvanicum</u>	<u>10</u>	<u>No</u>	<u>FACW</u>		
3. <u>Juncus effusus</u>	<u>5</u>	<u>No</u>	<u>FACW</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland J & K- DP20
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237933 Long: W 79.664599 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in an actively grazed pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Upland J & K- DP20
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>7</u> x 2 = <u>14</u> FAC species <u>23</u> x 3 = <u>69</u> FACU species <u>70</u> x 4 = <u>280</u> UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>363</u> (B) Prevalence Index = B/A = <u>3.63</u>	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Festuca sp.</u>	<u>65</u>	<u>Yes</u>	<u>FACU</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Xanthium strumarium</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>		
3. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>		
4. <u>Polygonum pennsylvanicum</u>	<u>5</u>	<u>No</u>	<u>FACW</u>		
5. <u>Dichantherium clandestinum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>		
6. <u>Juncus effusus</u>	<u>2</u>	<u>No</u>	<u>FACW</u>		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland J - DP21
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.238098 Long: W 79.664657 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in right floodplain of Candy Creek in actively grazed pasture. Majority of trees and saplings have been removed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Feature is within a shallow depression in the floodplain of Candy Creek.

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland J - DP21
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>15</u> x 2 = <u>30</u> FAC species <u>55</u> x 3 = <u>165</u> FACU species <u>30</u> x 4 = <u>120</u> UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>315</u> (B) Prevalence Index = B/A = <u>3.15</u>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ✓ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <u>Juncus effusus</u>	<u>35</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Festuca sp.</u>	<u>30</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Polygonum pennsylvanicum</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Xanthium strumarium</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
5. <u>Commelina communis</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland J - DP21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	2.5 Y 4/2	90	7.5 YR 4/6	10	C	PL	loam	
3-12	2.5 Y 5/3	90	7.5 YR 4/6	10	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland O - DP22
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.235957 Long: W 79.662411 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located within a mature forest in the floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland O - DP22
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Liquidambar styraciflua</u>	20	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Ulmus americana</u>	15	Yes	FACW	
3. <u>Acer rubrum</u>	10	No	FAC	
4. <u>Liriodendron tulipifera</u>	10	No	FACU	
5. _____				
6. _____				
7. _____				
8. _____				
55 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Impatiens capensis</u>	60	Yes	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Onoclea sensibilis</u>	10	No	FACW	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
70 = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland O- DP23
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.236007 Long: W 79.662432 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA), Nathalie Sandy Loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in floodplain of Candy Creek in mature forest.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOIL

Sampling Point: Upland O- DP23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	2.5Y 4/3	90	10 YR 4/6	10	C	PL	loam	
3-12	10YR 5/3	85	7.5 YR 4/6	15	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland N - DP24
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N Long: W Datum: _____
 Soil Map Unit Name: Codorus loam (CnA), Poplar forest sandy loam (PoE), NWI classification: _____
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in toe of slope that was ditched and plugged. Center is devoid of vegetation.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland N - DP24
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. <u>Liriodendron tulipifera</u>	60	Yes	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)
2. <u>Acer rubrum</u>	40	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	100 = Total Cover			Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Total % Cover of: _____ Multiply by: _____
1. <u>Liquidambar styraciflua</u>	15	Yes	FAC	OBL species _____ x 1 = _____
2. <u>Carpinus carolinana</u>	10	Yes	FAC	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
	25 = Total Cover			Hydrophytic Vegetation Indicators:
Herb Stratum (Plot size: <u>5'</u>)				<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
1. <u>Microstegium vimineum</u>	45	Yes	FAC	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
2. <u>Boehmeria cylindrica</u>	10	No	FACW	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
3. <u>Peltandra virginica</u>	5	No	OBL	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Arisaema triphyllum</u>	5	No	FACW	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	Definitions of Four Vegetation Strata:
8. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
9. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
10. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
11. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
12. _____	_____	_____	_____	
	65 = Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____ = Total Cover			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland N - DP24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 4/1	95	10YR 4/6	5	C	PL	silt loam	
5-12	10YR 4/1	92	7.5YR 4/6	8	C	PL	silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	(MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	(MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Stripped Matrix (S6)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland N - DP25
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.236416 Long: W 79.662700 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA), Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in a forested floodplain area along Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland N - DP25

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. <u>Liriodendron tulipifera</u>	50	Yes	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. <u>Acer rubrum</u>	30	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>Liquidambar styraciflua</u>	20	Yes	FAC	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____				
6. _____				
7. _____				
8. _____				
100 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Liquidambar styraciflua</u>	30	Yes	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
30 = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Microstregium vimineum</u>	45	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Toxicodendron radicans</u>	35	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
80 = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Upland N - DP25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 4/4	100					loam	
8-12	7.5YR 5/4	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland P - DP26
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.235010 Long: W 79.661408 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in mature forest.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland P - DP26
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Liriodendron tulipifera</u>	40	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)	
2. <u>Acer rubrum</u>	40	Yes	FAC		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
<u>80</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Impatiens capensis</u>	50	Yes	FACW		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
<u>50</u> = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Wetland P - DP26
Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	7.5YR 5/1	98	7.5YR 4/6	2	C	PL	sand	
4-12	2.5Y 3/1	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland P- DP27
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.234967 Long: W 79.661496 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in a mature forest.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland P- DP27

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Ulmus americana</u>	60	Yes	FACW	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)	
2. <u>Ailanthus altissima</u>	20	Yes	FACU		
3. <u>Liquidambar styraciflua</u>	5	No	FAC		
4. <u>Liriodendron tulipifera</u>	5	No	FACU		
5. _____					
6. _____					
7. _____					
8. _____					
	90			Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
		_____ = Total Cover		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstregium vimineum</u>	60	Yes	FAC		
2. <u>Impatiens capensis</u>	25	Yes	FACW		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
	85			Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. <u>Toxicodendron radicans</u>	15	Yes	FAC		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
	15			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
	_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: Upland P- DP27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/4	100					loam	
3-12	10YR 4/3	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland Q - DP28
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.235734 Long: W 79.660897 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in an old breached pond bed.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u> </u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland Q - DP28
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Quercus alba</u>	30	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)	
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
<u>30</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Polygonum pennsylvanicum</u>	60	Yes	FACW		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Boehmeria cylindrica</u>	30	Yes	FACW		
3. <u>Microstegium vimineum</u>	5	No	FAC		
4. <u>Panicum virgatum</u>	5	No	FAC		
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland Q- DP29
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.235590 Long: W 79.660973 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in active cattle pasture along UT1D.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland Q- DP29

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Quercus alba</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>20</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>90</u> x 3 = <u>270</u> FACU species <u>25</u> x 4 = <u>100</u> UPL species <u>5</u> x 5 = <u>25</u> Column Totals: <u>120</u> (A) <u>395</u> (B) Prevalence Index = B/A = <u>3.3</u>	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Festuca paradoxa</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Ranunculus sardous</u>	<u>5</u>	<u>No</u>	<u>UPL</u>		
3. <u>Trifolium repens</u>	<u>5</u>	<u>No</u>	<u>FACU</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>100</u> = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland R - DP30
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237263 Long: W 79.660111 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <p align="center">Sampling point located in the wooded upstream end of UT1C.</p>	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland R - DP30
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30' _____)				Dominance Test worksheet:
1. <u>Liquidambar styraciflua</u>	60	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <u>Liriodendron tulipifera</u>	40	Yes	FACU	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	100	= Total Cover		Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 15' _____)				Total % Cover of: _____ Multiply by: _____
1. _____	_____	_____	_____	OBL species _____ x 1 = _____
2. _____	_____	_____	_____	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
	_____	= Total Cover		Hydrophytic Vegetation Indicators:
Herb Stratum (Plot size: 5' _____)				<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
1. <u>Boehmeria cylindrica</u>	10	Yes	FACW	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
2. <u>Microstegium vimineum</u>	5	Yes	FAC	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
3. <u>Parthenocissus quinquefolia</u>	5	Yes	FACU	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. _____	_____	_____	_____	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	20	= Total Cover		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30' _____)				Definitions of Four Vegetation Strata:
1. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
2. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
3. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
4. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____	= Total Cover		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland R- DP31
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237219 Long: W 79.660117 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland R- DP31

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Liriodendron tulipifera</u>	<u>80</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25</u> (A/B)
2. <u>Carya ovata</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	<u>100</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>40</u> x 3 = <u>120</u> FACU species <u>130</u> x 4 = <u>520</u> UPL species _____ x 5 = _____ Column Totals: <u>170</u> (A) <u>640</u> (B) Prevalence Index = B/A = <u>3.8</u>
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Rosa multiflora</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Parthenocissus quinquefolia</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>30</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>Toxicodendron radicans</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>40</u>	= Total Cover		
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) .				

SOIL

Sampling Point: Upland R- DP31

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	7.5YR 3/3	100					loam	
1-12	7.5YR 4/6	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland M - DP32
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237639 Long: W 79.664406 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in a depressional area within forest.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland M - DP32
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	100	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	100	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Microstegium vimineum</u>	40	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Arisaema dracontium</u>	15	Yes	FACW	
3. <u>Boehmeria cylindrical</u>	10	No	FACW	
4. <u>Peltandra virginica</u>	5	No	OBL	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	70	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland M- DP33
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237544 Long: W 79.664412 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in right floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland M- DP33

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
1. <u>Acer rubrum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>90</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Ligustrum sinense</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>10</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Woodwardia areolata</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Microstegium vimineum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Dichantherium clandestinum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) .				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				

SOIL

Sampling Point: Upland M- DP33

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/3	90	7.5 YR 4/6	10	C	PL	loam	
4-12	10YR 4/3	80	7.5 YR 4/6	20	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland L - DP34
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237402 Long: W 79.664775 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA), Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in forested left floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>2</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>-</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland L - DP34
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. <u>Acer rubrum</u>	100	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	100 = Total Cover			Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 15')				Total % Cover of: _____ Multiply by: _____
1. <u>Lindera benzoin</u>	10	Yes	FAC	OBL species _____ x 1 = _____
2. _____	_____	_____	_____	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
	10 = Total Cover			Hydrophytic Vegetation Indicators:
Herb Stratum (Plot size: 5')				<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
1. <u>Arisaema triphyllum</u>	20	Yes	FACW	<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
2. <u>Microstegium vimineum</u>	20	Yes	FAC	<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
3. <u>Impatiens capensis</u>	20	Yes	FACW	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
4. <u>Boehmeria cylindrical</u>	10	No	FACW	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	70 = Total Cover			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30')				Definitions of Four Vegetation Strata:
1. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
2. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
3. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
4. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____ = Total Cover			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland L- DP35
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.237377 Long: W 79.664706 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA), Poplar forest sandy loam (PoE) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located near toe of slope in right floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland L- DP35

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>100</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. <u>Ligustrum sinense</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>10</u> = Total Cover					
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
2. <u>Polystichum acrostichoides</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>		
3. <u>Onoclea sensibilis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>60</u> = Total Cover					
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. <u>Toxicodendron radicans</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
<u>20</u> = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	

SOIL

Sampling Point: Upland L- DP35

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	10YR 5/8	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland S - DP36
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.233607 Long: W 79.660969 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in the forested floodplain of Candy Creek upstream of Hopkins Road.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input checked="" type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland S - DP36
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. <u>Acer rubrum</u>	75	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Liquidambar styraciflua</u>	20	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	95 = Total Cover			Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 15')				Total % Cover of: _____ Multiply by: _____
1. <u>Liquidambar styraciflua</u>	15	Yes	FAC	OBL species _____ x 1 = _____
2. <u>Magnolia virginiana</u>	5	Yes	FACW	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
10. _____	_____	_____	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
	20 = Total Cover			<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
Herb Stratum (Plot size: 5')				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
1. <u>Boehmeria cylindrical</u>	15	Yes	FACW	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
2. <u>Onoclea sensibilis</u>	10	Yes	FACW	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
3. <u>Symplocarpus foetidus</u>	5	No	OBL	
4. <u>Lobelia cardinalis</u>	2	No	FACW	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	Definitions of Four Vegetation Strata:
7. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
8. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
9. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
10. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	32 = Total Cover			
Woody Vine Stratum (Plot size: 30')				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____ = Total Cover			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland S&T - DP37
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.233285 Long: W 79.660994 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in right floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Upland S&T - DP37
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>75</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Ulmus americana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
3. <u>Liquidambar styraciflua</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>95</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Microstegium vimineum</u>	<u>80</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Woodwardia areolata</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
3. <u>Parthenocissus quinquefolia</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>90</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <u>Toxicodendron radicans</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>10</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) .				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

SOIL

Upland S&T - DP37
 Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/6	100					loam	
3-12	10YR 4/4	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland T - DP38
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.233225 Long: W 79.660925 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located near toe of slope in forest floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland T - DP38
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	100	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	100	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Microstegium vimineum</u>	10	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. <u>Parthenocissus quinquefolia</u>	10	Yes	FACU	
3. <u>Woodwardia areolata</u>	5	Yes	FACW	
4. <u>Arisaema triphyllum</u>	5	Yes	FACW	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	20	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
Hydrophytic Vegetation Present?				Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland U - DP39
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.232318 Long: W 79.659197 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located below berm of pond near outfall pipe in active cattle pasture. Saturation appears to be due to pond seepage.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) _____ True Aquatic Plants (B14) _____ High Water Table (A2) _____ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) _____ Oxidized Rhizospheres on Living Roots (C3) _____ Water Marks (B1) _____ Presence of Reduced Iron (C4) _____ Sediment Deposits (B2) _____ Recent Iron Reduction in Tilled Soils (C6) _____ Drift Deposits (B3) _____ Thin Muck Surface (C7) _____ Algal Mat or Crust (B4) _____ Other (Explain in Remarks) <input checked="" type="checkbox"/> Iron Deposits (B5) _____ Inundation Visible on Aerial Imagery (B7) _____ Water-Stained Leaves (B9) _____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> _____ Surface Soil Cracks (B6) _____ Sparsely Vegetated Concave Surface (B8) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery (C9) _____ Stunted or Stressed Plants (D1) _____ Geomorphic Position (D2) _____ Shallow Aquitard (D3) _____ Microtopographic Relief (D4) _____ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>1</u> Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland U - DP39
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	10	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Salix nigra</u>	10	Yes	OBL	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	20	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Impatiens capensis</u>	45	Yes	FACW	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Polygonum pennsylvanicum</u>	25	Yes	FACW	
3. <u>Polygonum sagittatum</u>	15	No	OBL	
4. <u>Boehmeria cylindrical</u>	15	No	FACW	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	100	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/13/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland U- DP40
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.232341 Long: W 79.659282 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located below berm of pond in active cattle pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland U- DP40

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>5</u> x 3 = <u>15</u> FACU species <u>90</u> x 4 = <u>360</u> UPL species _____ x 5 = _____ Column Totals: <u>95</u> (A) <u>375</u> (B) Prevalence Index = B/A = <u>3.9</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Festuca sp.</u>	<u>80</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
3. <u>Xanthium strumarium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. <u>Rubus argutus</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>95</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>
.				

SOIL

Sampling Point: Upland U- DP40

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	2.5Y 3/3	100					loam	
3-12	2.5Y 6/4	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland V - DP41
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231829 Long: W 79.658078 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaB), Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in up-valley delta adjacent to UT2 pond. The pond and delta area is significantly impacted by cattle.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland V - DP41
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: 30')					
1. <u>Salix nigra</u>	5	Yes	OBL	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
5 = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: 15')					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: 5')					
1. <u>Festuca sp.</u>	30	Yes	FACU		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polygonum pennsylvanicum</u>	25	Yes	FACW		
3. <u>Carex lurida</u>	25	Yes	OBL		
4. <u>Dichanthelium clandestinum</u>	10	No	FAC		
5. <u>Commelina communis</u>	10	No	FAC		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
100 = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: 30')					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland Y - DP42
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231646 Long: W 79.656906 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaB) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located up-valley of UT2 pond on UT2B. The area is significantly impacted by cattle. The wetland is groundwater driven and directly connected to stream.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland Y - DP42
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____	_____	_____	_____	
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Magnolia virginiana</u>	<u>40</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Acer rubrum</u>	<u>15</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>55</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Polygonum pennsylvanicum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Microstegium vimineum</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>90</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: Wetland Y - DP42

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					loam	
2-12	10YR 3/2	90	10 YR 4/3	10	C	PL	sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> (MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> (MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Red Parent Material (TF2)
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland Y- DP43
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231644 Long: W 79.656895 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaB) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in floodplain of UT2B in active cattle pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland Y- DP43

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
2. <u>Magnolia virginiana</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	<u>35</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Festuca sp.</u>	<u>80</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species <u>5</u> x 2 = <u>10</u> FAC species <u>33</u> x 3 = <u>99</u> FACU species <u>83</u> x 4 = <u>332</u> UPL species _____ x 5 = _____ Column Totals: <u>121</u> (A) <u>441</u> (B) Prevalence Index = B/A = <u>3.6</u>
2. <u>Dichanthelium clandestinum</u>	<u>3</u>	<u>No</u>	<u>FAC</u>	
3. <u>Solanum carolinense</u>	<u>3</u>	<u>No</u>	<u>FACU</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	<u>86</u>	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) .				

SOIL

Sampling Point: Upland Y- DP43

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	10YR 3/3	100					loam	
3-12	2.5Y 5/4	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland X - DP44
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231944 Long: W 79.657608 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located up-valley of UT2 pond in floodplain of UT2B. The area is significantly impacted by cattle. The wetland are is groundwater driven.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland X - DP44
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Fraxinus pennsylvanica</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>50</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Polygonum pennsylvanicum</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>		
3. <u>Boehmeria cylindrical</u>	<u>25</u>	<u>Yes</u>	<u>FACW</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>100</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland W - DP45
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231830 Long: W 79.657705 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located up-valley of UT2 pond in floodplain of UT2b. The area is significantly impacted by cattle. The wetland is directly connected to stream.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland W - DP45
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Fraxinus pennsylvanica</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
3. <u>Magnolia virginiana</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Impatiens capensis</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Microstegium vimineum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Boehmeria cylindrical</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
4. <u>Polygonum pennsylvanicum</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland W & X- DP46
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.231935 Long: W 79.657728 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in right floodplain of UT2b in active cattle pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Upland W & X- DP46
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>1</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>15</u> x 3 = <u>45</u> FACU species <u>85</u> x 4 = <u>340</u> UPL species _____ x 5 = _____ Column Totals: <u>100</u> (A) <u>385</u> (B) Prevalence Index = B/A = <u>3.85</u>
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Festuca sp.</u>	<u>80</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Dichantheium clandestinum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>	
3. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
4. <u>Xanthium strumarium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland V- DP47
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.232082 Long: W 79.658096 Datum: _____
 Soil Map Unit Name: Casville sandy loam (CaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/> Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in right floodplain of UT2B in active cattle pasture.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland V- DP47

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>35</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species <u>15</u> x 3 = <u>45</u> FACU species <u>85</u> x 4 = <u>340</u> UPL species _____ x 5 = _____ Column Totals: <u>95</u> (A) <u>385</u> (B) Prevalence Index = B/A = <u>4.05</u>	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Festuca sp.</u>	<u>80</u>	<u>Yes</u>	<u>FACU</u>		
2. <u>Dichanthelium clandestinum</u>	<u>10</u>	<u>No</u>	<u>FAC</u>		
3. <u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>		
4. <u>Xanthium strumarium</u>	<u>5</u>	<u>No</u>	<u>FAC</u>		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>100</u> = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <input checked="" type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: Upland V- DP47

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/3	100					loam	
4-12	10YR 6/6	100					sand	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland - DP48
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.230649 Long: W 79.657353 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation , Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point located in depression near top of UT2 in wooded area. Low area exhibits hydrology and hydrophytic vegetation but lacks hydric soils.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) <input checked="" type="checkbox"/> Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland - DP48

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____	_____	_____	_____	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Microstegium vimineum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Polystichum acrostichoides</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Campsis radicans</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) .				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland Z - DP49
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.230375 Long: W 79.661542 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland Z - DP49
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>88</u> (A/B)
1. <u>Liriodendron tulipifera</u>	<u>60</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Liquidambar styraciflua</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>85</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Magnolia virginiana</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Acer negundo</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Liquidambar styraciflua</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>15</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Impatiens capensis</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Microstegium vimineum</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>55</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <u>Toxicodendron radicans</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

SOIL

Sampling Point: Wetland Z - DP49

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	5YR 4/1	95	7.5YR 5/3	5	C	PL	clay loam	
2-8	10YR 5/2	95	5YR 5/8	5	C	PL	clay loam	
8-12	7.5 YR 4/1	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland Z- DP50
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.230418 Long: W 79.661567 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland Z- DP50

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
1. <u>Liriodendron tulipifera</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Liquidambar styraciflua</u>	<u>40</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>80</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Ulmus americana</u>	<u>15</u>	<u>Yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>15</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Microstegium vimineum</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Rubus argutus</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>60</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <u>Toxicodendron radicans</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Lonicera japonica</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>40</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) .				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				

SOIL

Sampling Point: Upland Z- DP50

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5YR 5/4	100					loam	
3-12	10YR 5/4	100					loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland AA - DP51
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.228574 Long: W 79.665462 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in incised gulley with active headcut.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>8</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland AA - DP51
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	70	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
2. <u>Liquidambar styraciflua</u>	20	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
	90	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
		= Total Cover		
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Polystichum acrostichoides</u>	10	Yes	FACU	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Impatiens capensis</u>	5	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
	15	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
		= Total Cover		
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/14/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland AA- DP52
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.228567 Long: W 79.665387 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland AA- DP52

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Liriodendron tulipifera</u>	50	Yes	FACU	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)	
2. <u>Acer rubrum</u>	35	Yes	FAC		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
	85	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
		= Total Cover		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	70	Yes	FAC		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Polygonum pennsylvanicum</u>	15	No	FAC		
3. <u>Phytolacca americana</u>	10	No	FACU		
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
	95	= Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
		= Total Cover		Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					
Remarks: (Include photo numbers here or on a separate sheet.) .					

SOIL

Sampling Point: Upland AA- DP52

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 4/3	100					clay loam	
6-12	10YR 4/3	75	10 YR 7/6	25	C	PL	sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland BB - DP53
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.223500 Long: W 79.659388 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Wetland feature is a saturated linear depression. A headcut is present at the downstream end of the feature where S6 originates.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland BB - DP53
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>70</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Liriodendron tulipifera</u>	<u>15</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>85</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Carpinus caroliniana</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Microstegium vimineum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Peltandra virginica</u>	<u>5</u>	<u>Yes</u>	<u>OBL</u>	
3. <u>Impatiens capensis</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
4. <u>Boehmeria cylindrical</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland BB-DP54
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.223488 Long: W 79.365941 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point in right flooplain of seep 6 located below wetland BB.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland BB-DP54

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>57</u> (A/B)
1. <u>Liriodendron tulipifera</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Acer rubrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Quercus phellos</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Quercus alba</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Fagus grandifolia</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>15</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. <u>Smilax rotundifolia</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Toxicodendron radicans</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>8</u> = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.) .				

SOIL

Sampling Point: Upland BB-DP54

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	7.5YR 3/3	100					loam	
1-5	10YR 4/3	100					sandy loam	
5-12	2.5Y 5/3	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland CC - DP55
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.223939 Long: W 79.659832 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located within incised gully. The gully starts at headcut and drains into Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland CC - DP55
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Acer rubrum</u>	25	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. <u>Betula nigra</u>	15	Yes	FACW		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
	40	= Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
		= Total Cover		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Impatiens capensis</u>	40	Yes	FACW		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. <u>Microstegium vimineum</u>	25	Yes	FAC		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
	65	= Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
		= Total Cover		Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland CC-DP56
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.224238 Long: W 79.659921 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks:	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Upland CC-DP56
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: 30' _____)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)	
1. <u>Betula nigra</u>	35	Yes	FACW		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____	_____	_____	_____		
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: 15' _____)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: 5' _____)					
1. <u>Impatiens capensis</u>	60	Yes	FACW		
2. <u>Boehmeria cylindrical</u>	25	Yes	FACW		
3. <u>Microstegium vimineum</u>	15	No	FAC		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
_____ = Total Cover				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.	
Woody Vine Stratum (Plot size: 30' _____)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
_____ = Total Cover					Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____
Remarks: (Include photo numbers here or on a separate sheet.)					
.					

SOIL

Sampling Point: Upland CC-DP56

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	2.5Y 5/3	75	10YR 4/6	25	C	PL	loam	
8-12	2.5Y 5/3	85	7.5YR 4/6	15	C	PL	loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> (MLRA 147, 148)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> (MLRA 136, 147)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
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Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland DD - DP57
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.226996 Long: W 79.661594 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located at toe of slope in right floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland DD - DP57
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. <u>Acer rubrum</u>	40	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Liquidambar styraciflua</u>	35	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	<u>75</u> = Total Cover			Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 15')				Total % Cover of: _____ Multiply by: _____
1. <u>Magnolia virginiana</u>	15	Yes	FACW	OBL species _____ x 1 = _____
2. <u>Sambucus nigra</u>	5	Yes	FAC	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
10. _____	_____	_____	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
	<u>20</u> = Total Cover			<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
Herb Stratum (Plot size: 5')				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
1. <u>Microstegium vimineum</u>	30	Yes	FAC	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
2. <u>Boehmeria cylindrical</u>	15	Yes	FACW	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
3. _____	_____	_____	_____	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Definitions of Four Vegetation Strata:
6. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
7. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	<u>45</u> = Total Cover			
Woody Vine Stratum (Plot size: 30')				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____ = Total Cover			Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland DD-DP58
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.226954 Long: W 79.661671 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point is located in right floodplain of Candy Creek in between Wetland DD and Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland DD-DP58

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>30'</u>)					
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
<u>100</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
Sapling/Shrub Stratum (Plot size: <u>15'</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
_____ = Total Cover				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
Herb Stratum (Plot size: <u>5'</u>)					
1. <u>Microstegium vimineum</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>		¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
12. _____	_____	_____	_____		
<u>10</u> = Total Cover				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	
Woody Vine Stratum (Plot size: <u>30'</u>)					
1. <u>Toxicodendron radicans</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
<u>5</u> = Total Cover					
Remarks: (Include photo numbers here or on a separate sheet.)					

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland EE - DP59
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.227657 Long: W 79.661815 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located at toe of slope in right floodplain of Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland EE - DP59
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. <u>Acer rubrum</u>	40	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Platanus occidentalis</u>	30	Yes	FACW	Total Number of Dominant Species Across All Strata: <u>8</u> (B)
3. <u>Liriodendron tulipifera</u>	20	Yes	FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
90 = Total Cover				
Sapling/Shrub Stratum (Plot size: 15')				
1. <u>Magnolia virginiana</u>	10	Yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
10 = Total Cover				
Herb Stratum (Plot size: 5')				
1. <u>Rubus argutus</u>	10	Yes	FACU	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Juncus effuses</u>	5	Yes	FACW	
3. <u>Arisaema dracontium</u>	5	Yes	FACW	
4. <u>Boehmeria cylindrical</u>	2	No	FACW	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
22 = Total Cover				
Woody Vine Stratum (Plot size: 30')				
1. <u>Smilax rotundifolia</u>	15	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
15 = Total Cover				
Definitions of Four Vegetation Strata:				
Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.				
Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.				
Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.				
Woody vine – All woody vines greater than 3.28 ft in height.				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland EE-DP60
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.227644 Long: W 79.661968 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point is located in right floodplain of Candy Creek in between Wetland EE and Candy Creek.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland EE-DP60

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Ligustrum sinense</u>	<u>5</u>	<u>Yes</u>	<u>FACU</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Microstegium vimineum</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>20</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u>Smilax rotundifolia</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>30</u> = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____

SOIL

Sampling Point: Upland EE-DP60

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-1	7.5YR 3/2	100					loam	
1-12	10YR 5/6	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils³:	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>
---	---

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland FF - DP61
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.22675 Long: W 79.66240 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in small pocket wetland at head of gully.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland FF - DP61
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
				¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks: (Include photo numbers here or on a separate sheet.)

Feature is located under a closed canopy of red maple but otherwise is devoid of vegetation.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland FF-DP62
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.226821 Long: W 79.662456 Datum: _____
 Soil Map Unit Name: Codorus loam (CnA) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point is located at lower end of gully. Area exhibits hydrology in the form of water stained leaves and has hydrophytic vegetation but lacks hydric soils.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Upland FF-DP62
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. <u>Acer rubrum</u>	50	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)
2. <u>Liquidambar styraciflua</u>	35	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>7</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86</u> (A/B)
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
	85	= Total Cover		Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Total % Cover of: _____ Multiply by: _____
1. <u>Liquidambar styraciflua</u>	50	Yes	FAC	OBL species _____ x 1 = _____
2. <u>Carya ovata</u>	30	Yes	FACU	FACW species _____ x 2 = _____
3. _____	_____	_____	_____	FAC species _____ x 3 = _____
4. _____	_____	_____	_____	FACU species _____ x 4 = _____
5. _____	_____	_____	_____	UPL species _____ x 5 = _____
6. _____	_____	_____	_____	Column Totals: _____ (A) _____ (B)
7. _____	_____	_____	_____	Prevalence Index = B/A = _____
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	Hydrophytic Vegetation Indicators:
10. _____	_____	_____	_____	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation
	80	= Total Cover		<input checked="" type="checkbox"/> 2 - Dominance Test is >50%
Herb Stratum (Plot size: <u>5'</u>)				<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹
1. <u>Microstegium vimineum</u>	10	Yes	FAC	<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
2. <u>Boehmeria cylindrical</u>	10	Yes	FACW	<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
3. <u>Polygonum pennsylvanicum</u>	5	Yes	FAC	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	Definitions of Four Vegetation Strata:
6. _____	_____	_____	_____	Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.
7. _____	_____	_____	_____	Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.
8. _____	_____	_____	_____	Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.
9. _____	_____	_____	_____	Woody vine – All woody vines greater than 3.28 ft in height.
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
	25	= Total Cover		
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
	_____	= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland GG - DP63
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.22335 Long: W 79.66244 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located downstream of pond on UT5A. Wetland originates near berm of pond, which is located upstream, outside project area.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
1. <u>Acer rubrum</u>	<u>100</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____	_____	_____	_____	
<u>100</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Alliaria petiolata</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Microstegium vimineum</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland GG & HH- DP64
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.223219 Long: W 79.662434 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point is located at lower end of gully.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet:
1. <u>Acer rubrum</u>	60	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. <u>Platanus occidentalis</u>	20	Yes	FACW	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>Liriodendron tulipifera</u>	20	Yes	FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
100 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Acer rubrum</u>	10	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
10 = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Boehmeria cylindrical</u>	10	Yes	FACW	
2. <u>Microstegium vimineum</u>	5	Yes	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
15 = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.) .				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	7.5YR 4/3	100					loam	
3-8	10YR 4/4	100					loam	
8-12	10YR 8/6	100					sandy loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 136, 122)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes _____ No

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland HH- DP65
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.223148 Long: W 79.662504 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located immediately below pond berm above UT5A.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland HH- DP65
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: _____ (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: 15')				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: 5')				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Impatiens capensis</u>	80	Yes	FACW	
2. <u>Sagittaria lancifolia</u>	15	No	OBL	
3. <u>Typha sp.</u>	5	No	OBL	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
100 _____ = Total Cover				
Woody Vine Stratum (Plot size: 30')				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Wetland JJ- DP66
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.227925 Long: W 79.660901 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: Sampling point located in old pond bed on UT3.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <input checked="" type="checkbox"/> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u><12</u>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Wetland JJ- DP66
Sampling Point: _____

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: 30')				Dominance Test worksheet:
1. <u>Acer rubrum</u>	25	Yes	FAC	Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)
2. <u>Liquidambar styraciflua</u>	25	Yes	FAC	Total Number of Dominant Species Across All Strata: <u>6</u> (B)
3. <u>Liriodendron tulipifera</u>	25	Yes	FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)
4. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
100 = Total Cover				
Sapling/Shrub Stratum (Plot size: 15')				
1. <u>Carpinus caroliniana</u>	25	Yes	FAC	
2. <u>Sambucus canadensis</u>	2	No	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
27 = Total Cover				
Herb Stratum (Plot size: 5')				
1. <u>Microstegium vimineum</u>	60	Yes	FACW	
2. <u>Impatiens capensis</u>	20	Yes	FACW	
3. <u>Boehmeria cylindrical</u>	18	No	FACW	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
98 = Total Cover				
Woody Vine Stratum (Plot size: 30')				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Remarks: (Include photo numbers here or on a separate sheet.)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Candy Creek Full Delivery Project City/County: Guilford Sampling Date: 8/15/14
 Applicant/Owner: Wildlands Engineering State: NC Sampling Point: Upland JJ-DP67
 Investigator(s): Ian Eckardt & Kenton Beal Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 0
 Subregion (LRR or MLRA): MLRA 136 Lat: N 36.227904 Long: W 79.660921 Datum: _____
 Soil Map Unit Name: Nathalie sandy loam (NaC) NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: Sampling point is located on hillside adjacent to Wetland JJ.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ True Aquatic Plants (B14) ___ High Water Table (A2) ___ Hydrogen Sulfide Odor (C1) ___ Saturation (A3) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1) ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3) ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4) ___ Other (Explain in Remarks) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) ___ Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) ___ Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <input checked="" type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Upland JJ-DP67

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30'</u>)				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>Acer rubrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Liquidambar styraciflua</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Liriodendron tulipifera</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
4. <u>Quercus rubra</u>	<u>10</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
<u>70</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Acer rubrum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>30</u> = Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
1. <u>Lonicera japonica</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Woodwardia areolata</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
12. _____	_____	_____	_____	
<u>10</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vine – All woody vines greater than 3.28 ft in height.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.) .				

**U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT**

Action Id. SAW-2015-01209 County: Guilford U.S.G.S. Quad: NC-BROWNS SUMMIT

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Applicant: NC Division of Mitigation Services
attn: Tim Baumgartner
Address: 1652 Mail Service Center
Raleigh, NC 27699-1652

Agent: Wildlands Engineering, Inc.
attn: Ian Eckardt
Address: 1430 South Mint Street, Suite 104
Charlotte, NC 27203

Size (acres) ~56
Nearest Waterway Candy Creek
USGS HUC 3030002

Nearest Town Monticello
River Basin Haw. North Carolina.
Coordinates 36.232801 N, -79.662466 W

Location description: The site includes approximately 18,000 feet of Candy Creek and unnamed tributaries, and is located both north and south of Hopkins Road, approximately 1.5 miles northeast of Monticello in northeastern Guilford County, North Carolina.

Indicate Which of the Following Apply:

A. Preliminary Determination

Based on preliminary information, there may be waters of the U.S. including wetlands on the above described project area. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

B. Approved Determination

There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

There are waters of the U.S. including wetlands on the above described project area subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

We strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

The waters of the U.S. including wetlands on your project area have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

The waters of the U.S. including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

There are no waters of the U.S., to include wetlands, present on the above described project area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

Y900

- The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management to determine their requirements.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact David Bailey at 919-554-4884 ext 30 or David.E.Bailey2@usace.army.mil.

C. Basis For Determination:

The project area exhibits water bodies with ordinary high water and wetland criteria as defined in the applicable regional supplement to the 1987 wetland delineation manual. The water bodies on the site include Candy Creek and 21 Unnamed Tributaries (UTs), all Relatively Permanent Waters (RPWs), which flow via Candy Creek (RPW) to the Haw River, a Traditionally Navigable Water – and abutting and adjacent wetlands. This determination is based on a field verification by David E. Bailey (USACE) on 3/10/2015.

D. Remarks:

The wetlands and other Waters of the US on the property were flagged by Wildlands Engineering with changes made in the field by David E. Bailey (USACE) and are approximated on the attached sheets titled “Figure 3 - Overall Site Map”, “Figure 3.1 - Site Map”, “Figure 3.2 - Site Map”, and “Figure 3.3 - Site Map.”

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps’ Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
 South Atlantic Division
 Attn: Jason Steele, Review Officer
 60 Forsyth Street SW, Room 10M15
 Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by August 9, 2015.

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: BAILEY.DAVID.E.1379283 736 Digitally signed by BAILEY.DAVID.E.1379283736
 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
 ou=USA, cn=BAILEY.DAVID.E.1379283736
 Date: 2015.06.10 15:51:37 -04'00'

Date: June 10, 2015

Expiration Date: June 10, 2020

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our Customer Satisfaction Survey, located online at http://regulatory.usacesurvey.com/.

Copy furnished:
 Sue Homewood, NCDENR-DWR, 450 W. Hanes Mill Rd, Suite 300, Winston-Salem, NC 27105

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: **NCDMS** | File Number: **SAW-2015-01209** | Date: **June 10, 2015**

Attached is: | See Section below

<input type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input checked="" type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:
District Engineer, Wilmington Regulatory Division
attn: David E. Bailey
Raleigh Regulatory Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

If you only have questions regarding the appeal process you may also contact:
Mr. Jason Steele, Administrative Appeal Review Officer
CESAD-PDO
U.S. Army Corps of Engineers, South Atlantic Division
60 Forsyth Street, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date: _____

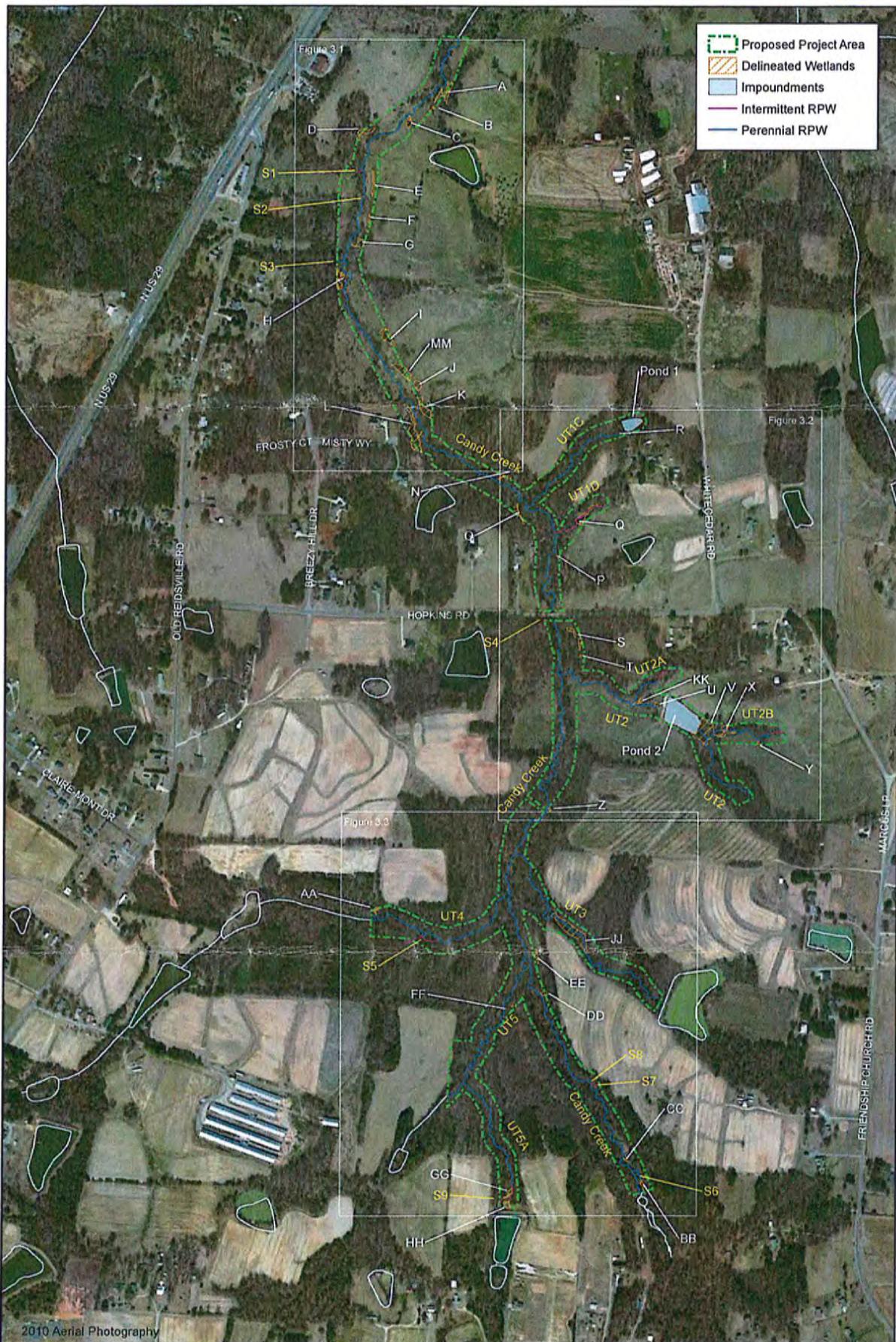
Telephone number: _____

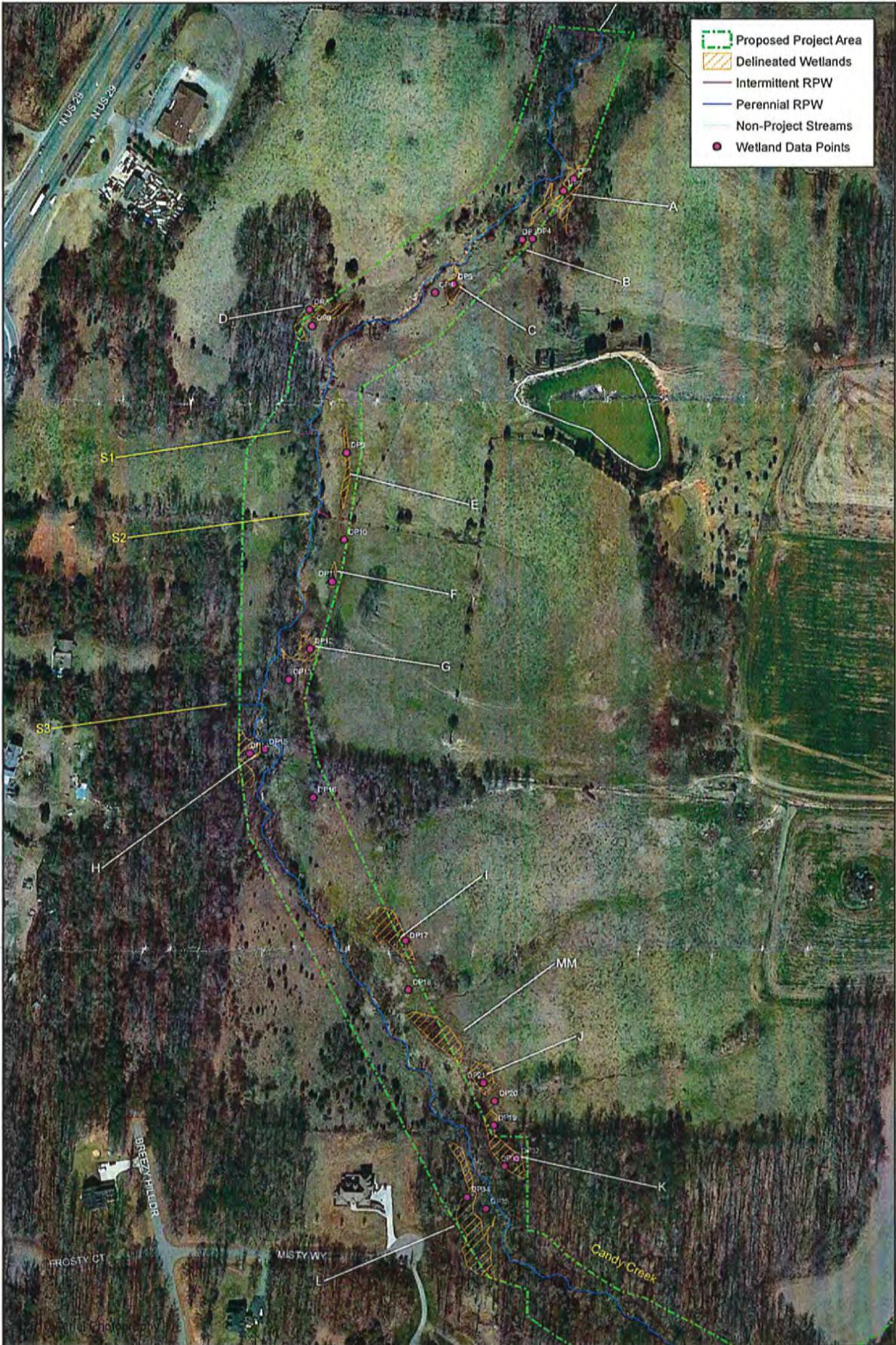
For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: David Bailey, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137





- Proposed Project Area
- Delineated Wetlands
- Intermittent RPW
- Perennial RPW
- Non-Project Streams
- Wetland Data Points

Figure 3.1 - Site Map
Candy Creek Stream Mitigation Site
Cape Fear River Basin (03030002)
Guilford County





- Proposed Project Area
- Delineate Wetlands
- Intermittent RPW
- Perennial RPW
- Non-Project Streams
- Wetland Data Points



North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

May 13, 2015

Mr. Ian Eckardt
Wildlands Engineering Inc.
1430 S. Mint St, Suite 104
Charlotte, NC 28203

Subject Property: Candy Creek Mitigation Site, Guilford County

On-Site Determination for Applicability to the Mitigation Rules (15A NCAC 2H .0500)

Dear Mr. Eckardt:

On March 10, 2015, at your request and in your attendance, Sue Homewood conducted an on-site determination to review features located on the subject project for stream determinations with regards to the above noted state regulations. Ginny Baker with the Division and David Bailey with the US Army Corps of Engineers (USACE) were also present at the site visit.

The Division acknowledges the areas and boundaries identified as jurisdictional wetlands by the USACE. The attached updated maps accurately depict all stream determinations conducted during the site visit.

Please note that at the time of this letter, all intermittent and perennial stream channels and jurisdictional wetlands found on the property are subject to the mitigation rules cited above. These regulations are subject to change in the future.

The owner (or future owners) should notify the Division (and other relevant agencies) of this decision in any future correspondences concerning this property. 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 Division or Delegated Local Authority that a surface water exists and that it is subject to the buffer rule may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o Wetlands and Buffers Permitting and Compliance Unit, 1650 Mail Service Center, Raleigh, NC 27699-1650. Individuals that dispute a determination by the Division or Delegated Local Authority that "exempts" surface water from the buffer rule may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. Applicants are hereby notified that the 60-day statutory appeal time does not start until the affected party (including downstream and adjacent landowners) is notified of this decision. The Division recommends that the applicant conduct this notification in order to be certain that third party appeals are made in a timely manner. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This determination is final and binding unless you ask for a hearing within 60 days.

This letter only addresses the applicability to the mitigation rules and the buffer rules and does not approve any activity within Waters of the United States or Waters of the State or their associated buffers. If you have any additional questions or require additional information please contact me at 336-771-4964 or sue.homewood@ncdenr.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Sue Homewood", with a large, stylized flourish at the end.

Sue Homewood
Winston-Salem Regional Office

Enclosures: USGS Topo Map
Wildlands Stream/Wetland Map

cc: David Bailey, USACE Raleigh Regulatory Field Office (via email)
DWR, Winston-Salem Regional Office



Photo 1: Candy Creek Reach 1 restoration reach



Photo 2: Candy Creek Reach 2 restoration reach



Photo 3: Candy Creek Reach 3 enhancement reach



Photo 4: Candy Creek Reach 4 restoration reach



Photo 5: Pond to be removed on UT1c



Photo 6: UT1c restoration reach



Photo 7: UT1d restoration reach



Photo 8: Pond to be removed on UT2



Photo 9: UT2 enhancement reach



Photo 10: UT2a enhancement reach



Photo 11: UT3



Photo 12: UT3 preservation reach



Photo 13: UT4 restoration reach

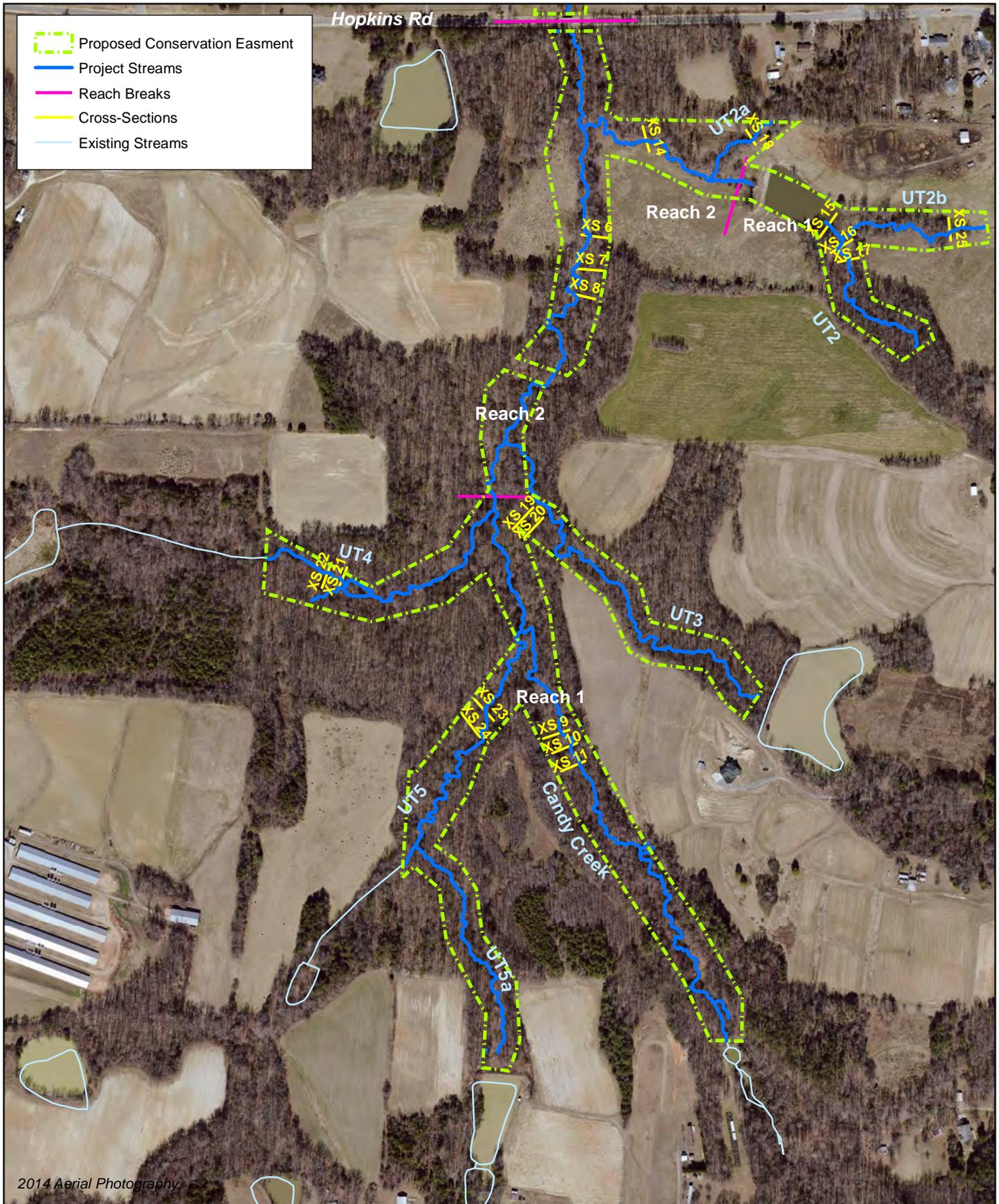


Photo 14: UT5 restoration reach



Photo 15: UT5a preservation reach

**Appendix 5: Existing Geomorphic Survey Data
Reference Reach Data**

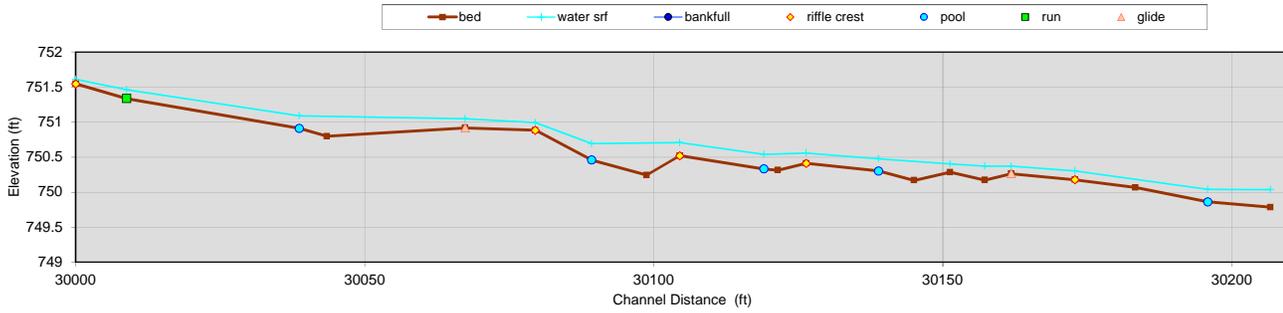


Candy Creek Stream Mitigation Site
 Site Map (South)
 Cape Fear River Basin (03030002)

Guilford County, NC

Longitudinal Slope Profile

Candy Creek Reach 1

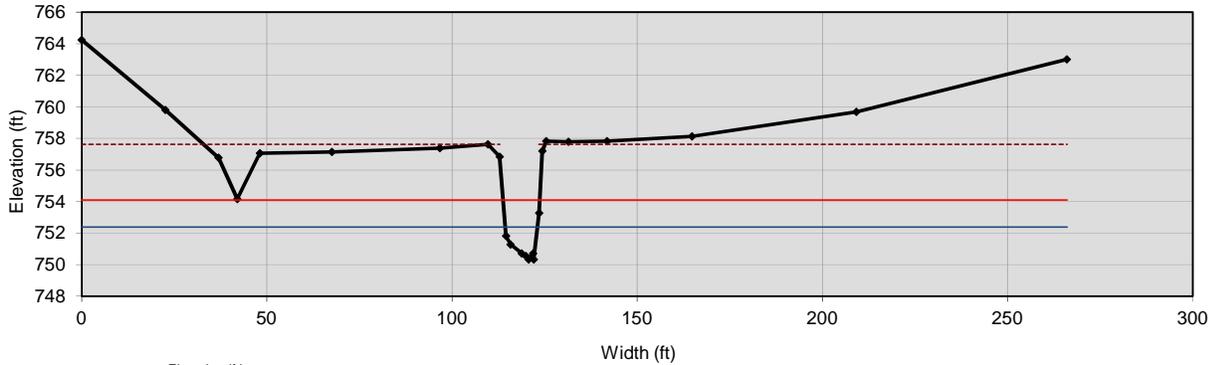


	slope (%)	slope ratio	length (ft)	length ratio	pool-pool spacing (ft)	p-p ratio
reach	0.76	---	30206.7 (3005.9 channel width)	---	---	---
riffle	1.5 (0.66 - 3.1)	2 (0.9 - 4.1)	13.7 (8.8 - 23)	1.4 (0.9 - 2.3)	---	---
pool	0.054 (0 - 0.46)	0.1 (0 - 0.6)	18.6 (7.3 - 28.7)	1.9 (0.7 - 2.9)	39.3 (19.8 - 56.)	3.9 (2 - 5.7)
run	1.2	1.6	29.9	3	---	---
glide	0.54 (0.48 - 0.61)	0.7 (0.6 - 0.8)	11.5 (11 - 12.1)	1.1 (1.1 - 1.2)	---	---

notes	cross section ID	bed feature	BkF channel centerline				user defined					
			easting (ft)	northing (ft)	station	ELEV centerline	ELEV thalweg	ELEV water	ELEV bankfull	ELEV LTB	ELEV RTB	ELEV c
(TWG)TWG		R			30000.0		751.547	751.61				
(TWG)TWG		N			30008.9		751.336	751.462			758.241	758.064
(TWG)TWG		P			30038.7		750.911	751.089			758.635	757.755
(TWG)TWG					30043.5		750.797				758.382	757.258
(TWG)TWG		G			30067.4		750.917	751.05				757.487
(TWG)TWG		R			30079.5		750.883	750.992				
(TWG)TWG		P			30089.3		750.459	750.693				758.074
(TWG)TWG					30098.8		750.243					757.817
(TWG)TWG		R			30104.5		750.519	750.707			758.388	758.359
(TWG)TWG		P			30119.1		750.332	750.537				
(TWG)TWG					30121.5		750.313				757.143	
(TWG)TWG		R			30126.4		750.411	750.558				757.551
(TWG)TWG		P			30138.9		750.301	750.475			757.034	
(TWG)TWG					30145.1		750.168					
(TWG)TWG					30151.3		750.283	750.403			756.931	757.265
(TWG)TWG					30157.3		750.173	750.371				
(TWG)TWG		G			30161.9		750.264	750.37				
(TWG)TWG		R			30172.8		750.177	750.303			756.86	756.772
(TWG)TWG					30183.3		750.065					756.519
(TWG)TWG		P			30195.8		749.86	750.038			756.982	
(TWG)TWG					30206.7		749.783	750.035				
					0.0							

Cross Section 9

Candy Creek Reach 1, pool



Bankfull Dimensions

12.3	x-section area (ft.sq.)
8.7	width (ft)
1.4	mean depth (ft)
2.1	max depth (ft)
10.9	wetted perimeter (ft)
1.1	hyd radi (ft)
6.1	width-depth ratio

Flood Dimensions

9.9	W flood prone area (ft)
1.1	entrenchment ratio
7.3	low bank height (ft)
3.5	low bank height ratio

Materials

9.8	D50 Riffle (mm)
23	D84 Riffle (mm)
26	threshold grain size (mm):

Bankfull Flow

5.3	velocity (ft/s)
65.0	discharge rate (cfs)
0.88	Froude number

Flow Resistance

0.026	Manning's roughness
0.08	D'Arcy-Weisbach fric.
10.1	resistance factor u/u*
18.7	relative roughness

Forces & Power

0.76	channel slope (%)
0.53	shear stress (lb/sq.ft.)
0.52	shear velocity (ft/s)
3.6	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

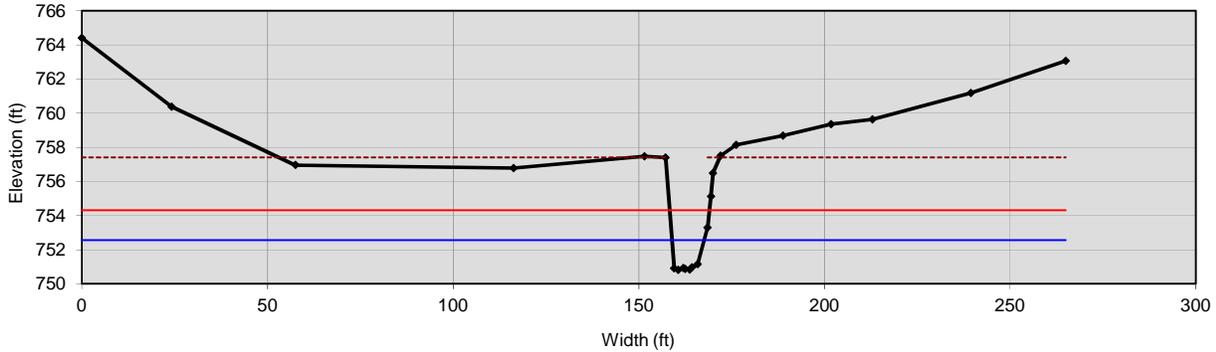
D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	764.235	<input type="checkbox"/>	
			759.795	<input type="checkbox"/>	
			756.771	<input type="checkbox"/>	
			754.156	<input type="checkbox"/>	
			757.065	<input type="checkbox"/>	
			757.148	<input type="checkbox"/>	
			757.378	<input type="checkbox"/>	
			757.626	<input type="checkbox"/>	
			756.829	<input type="checkbox"/>	
			751.811	<input type="checkbox"/>	
			751.279	<input type="checkbox"/>	
			750.701	<input type="checkbox"/>	
			750.548	<input type="checkbox"/>	
			750.316	<input type="checkbox"/>	
			750.713	<input type="checkbox"/>	
			750.332	<input type="checkbox"/>	
			753.259	<input type="checkbox"/>	
			757.2	<input type="checkbox"/>	
			757.83	<input type="checkbox"/>	
			757.778	<input type="checkbox"/>	
			757.828	<input type="checkbox"/>	
			758.128	<input type="checkbox"/>	
			759.682	<input type="checkbox"/>	
			763.013	<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Cross Section 10

Candy Creek Reach 1, riffle



Bankfull Dimensions

12.1	x-section area (ft.sq.)
8.7	width (ft)
1.4	mean depth (ft)
1.8	max depth (ft)
10.4	wetted perimeter (ft)
1.2	hyd radi (ft)
6.2	width-depth ratio

Flood Dimensions

10.7	W flood prone area (ft)
1.2	entrenchment ratio
6.6	low bank height (ft)
3.8	low bank height ratio

Materials

9.8	D50 Riffle (mm)
23	D84 Riffle (mm)
27	threshold grain size (mm):

Bankfull Flow

5.4	velocity (ft/s)
65.0	discharge rate (cfs)
0.88	Froude number

Flow Resistance

0.027	Manning's roughness
0.08	D'Arcy-Weisbach fric.
10.0	resistance factor u/u*
18.5	relative roughness

Forces & Power

0.76	channel slope (%)
0.55	shear stress (lb/sq.ft.)
0.53	shear velocity (ft/s)
3.6	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

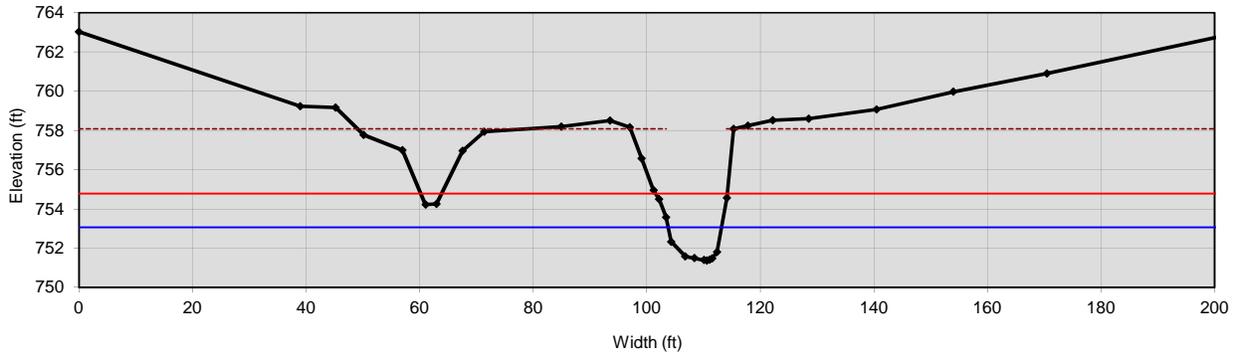
D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
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			760.378	<input type="checkbox"/>	
			756.956	<input type="checkbox"/>	
			756.771	<input type="checkbox"/>	
			757.467	<input type="checkbox"/>	
			757.402	<input type="checkbox"/>	
			750.91	<input type="checkbox"/>	
			750.809	<input type="checkbox"/>	
			750.928	<input type="checkbox"/>	
			750.872	<input type="checkbox"/>	
			750.84	<input type="checkbox"/>	
			750.973	<input type="checkbox"/>	
			751.152	<input type="checkbox"/>	
			753.3	<input type="checkbox"/>	
			755.122	<input type="checkbox"/>	
			756.477	<input type="checkbox"/>	
			757.498	<input type="checkbox"/>	
			758.145	<input type="checkbox"/>	
			758.673	<input type="checkbox"/>	
			759.348	<input type="checkbox"/>	
			759.633	<input type="checkbox"/>	
			761.182	<input type="checkbox"/>	
			763.062	<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Cross Section 11

Candy Creek Reach 1, riffle



Bankfull Dimensions

12.3	x-section area (ft.sq.)
9.4	width (ft)
1.3	mean depth (ft)
1.7	max depth (ft)
10.7	wetted perimeter (ft)
1.2	hyd radi (ft)
7.2	width-depth ratio

Flood Dimensions

16.2	W flood prone area (ft)
1.7	entrenchment ratio
6.7	low bank height (ft)
3.9	low bank height ratio

Materials

9.8	D50 Riffle (mm)
23	D84 Riffle (mm)
27	threshold grain size (mm):

Bankfull Flow

5.3	velocity (ft/s)
65.0	discharge rate (cfs)
0.87	Froude number

Flow Resistance

0.027	Manning's roughness
0.08	D'Arcy-Weisbach fric.
10.0	resistance factor u/u*
17.3	relative roughness

Forces & Power

0.76	channel slope (%)
0.55	shear stress (lb/sq.ft.)
0.53	shear velocity (ft/s)
3.3	unit strm power (lb/ft/s)

Cross Section

reference ID: 11
 longitudinal station: ---
 alignment: straight line
 feature: ---

Bankfull Stage

elevation: 753.0659

Low Bank Height

elevation: 758.079

Flood Prone Area

width fpa: 16.2

Channel Slope

percent slope: 0.76

Flow Resistance

Manning's "n": 0.027
 D'Arcy - Weisbach "f": 0.08

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	763.03	<input type="checkbox"/>	
			759.239	<input checked="" type="checkbox"/>	
			759.161	<input checked="" type="checkbox"/>	
			757.778	<input checked="" type="checkbox"/>	
			756.993	<input checked="" type="checkbox"/>	
			754.225	<input checked="" type="checkbox"/>	
			754.254	<input checked="" type="checkbox"/>	
			756.963	<input type="checkbox"/>	
			757.932	<input type="checkbox"/>	
			758.201	<input type="checkbox"/>	
			758.506	<input type="checkbox"/>	
			758.159	<input type="checkbox"/>	
			756.571	<input type="checkbox"/>	
			754.957	<input type="checkbox"/>	
			754.495	<input type="checkbox"/>	
			753.577	<input type="checkbox"/>	
			752.331	<input type="checkbox"/>	
			751.582	<input type="checkbox"/>	
			751.488	<input type="checkbox"/>	
			751.392	<input type="checkbox"/>	
			751.359	<input type="checkbox"/>	
			751.422	<input type="checkbox"/>	
			751.48	<input type="checkbox"/>	
			751.801	<input type="checkbox"/>	
			754.567	<input type="checkbox"/>	
			758.079	<input type="checkbox"/>	

Reachwide and Cross Section Pebble Count Plots

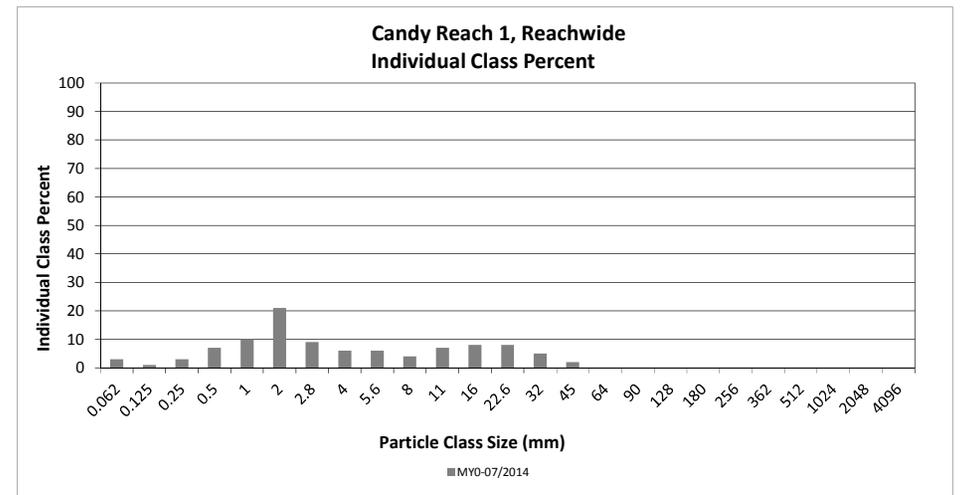
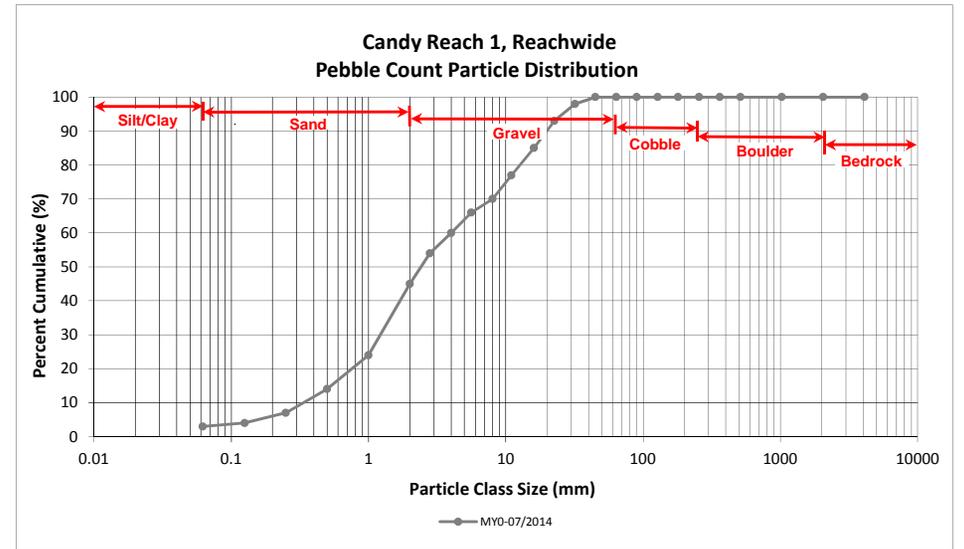
Candy Creek Mitigation Site

Existing Conditions - 2014

Candy Reach 1, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	2	3	3	3
SAND	Very fine	0.062	0.125		1	1	1	4
	Fine	0.125	0.250		3	3	3	7
	Medium	0.25	0.50	1	6	7	7	14
	Coarse	0.5	1.0	2	8	10	10	24
	Very Coarse	1.0	2.0	10	11	21	21	45
GRAVEL	Very Fine	2.0	2.8	4	5	9	9	54
	Very Fine	2.8	4.0	3	3	6	6	60
	Fine	4.0	5.6	5	1	6	6	66
	Fine	5.6	8.0	4		4	4	70
	Medium	8.0	11.0	7		7	7	77
	Medium	11.0	16.0	8		8	8	85
	Coarse	16.0	22.6	8		8	8	93
	Coarse	22.6	32	5		5	5	98
	Very Coarse	32	45	2		2	2	100
	Very Coarse	45	64					100
COBBLE	Small	64	90					100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				60	40	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	0.57
D ₃₅ =	1.44
D ₅₀ =	2.4
D ₈₄ =	15.3
D ₉₅ =	26.0
D ₁₀₀ =	45.0



Reachwide and Cross Section Pebble Count Plots

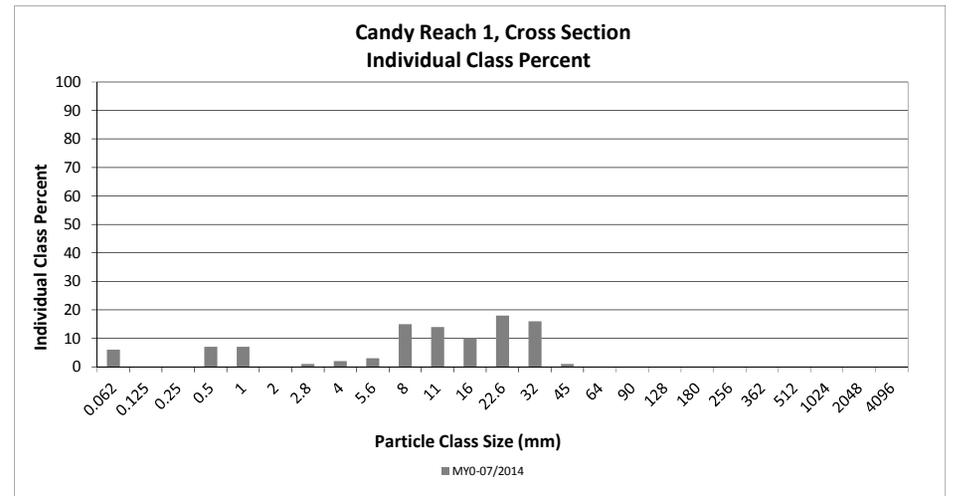
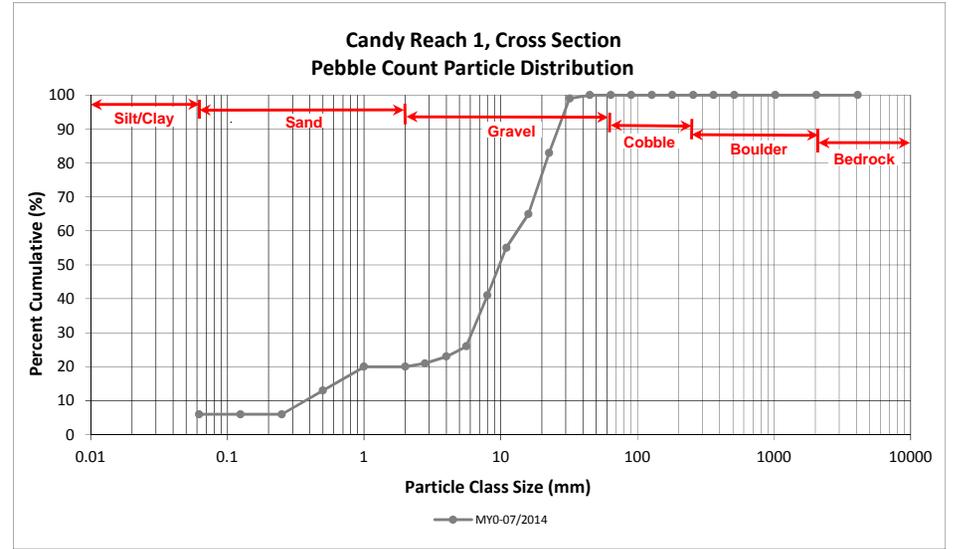
Candy Creek Mitigation Site

Existing Conditions - 2014

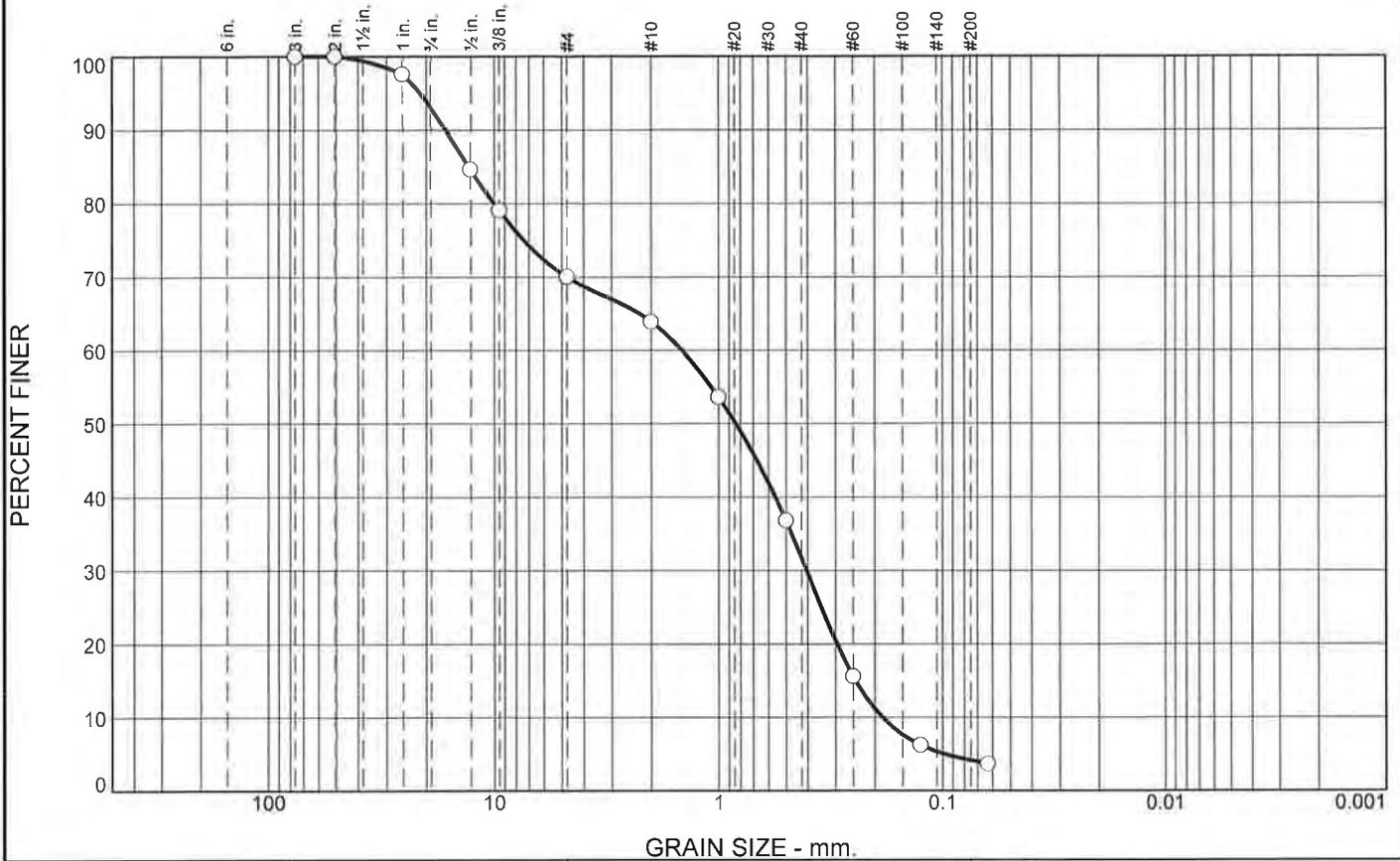
Candy Reach 1, Cross Section 10

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250			6
	Medium	0.25	0.50	7	7	13
	Coarse	0.5	1.0	7	7	20
	Very Coarse	1.0	2.0			20
GRAVEL	Very Fine	2.0	2.8	1	1	21
	Very Fine	2.8	4.0	2	2	23
	Fine	4.0	5.6	3	3	26
	Fine	5.6	8.0	15	15	41
	Medium	8.0	11.0	14	14	55
	Medium	11.0	16.0	10	10	65
	Coarse	16.0	22.6	18	18	83
	Coarse	22.6	32	16	16	99
	Very Coarse	32	45	1	1	100
	Very Coarse	45	64			100
COBBLE	Small	64	90			100
	Small	90	128			100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
Total				100	100	100

Cross Section 10	
Channel materials (mm)	
D ₁₆ =	0.67
D ₃₅ =	6.94
D ₅₀ =	9.8
D ₈₄ =	23.1
D ₉₅ =	29.3
D ₁₀₀ =	45.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.9	23.1	6.1	32.2	27.6	4.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	97.6		
0.5	84.7		
0.375	79.1		
#4	70.0		
#10	63.9		
#18	53.6		
#35	36.8		
#60	15.6		
#120	6.2		
#230	3.7		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL= PI=

Coefficients

D₉₀= 16.3166 D₈₅= 12.8955 D₆₀= 1.4563

D₅₀= 0.8377 D₃₀= 0.4039 D₁₅= 0.2437

D₁₀= 0.1853 C_u= 7.86 C_c= 0.60

Classification

USCS= SP AASHTO=

Remarks

Secondary Axis: 1.89", 1.38"

Total Weight: 2110.4g

Location: Reach 1, XS-10, Subpave 7/9 CM,EN

Date: 08-18-14

<p style="text-align: center;">Summit Engineering</p> <p style="text-align: center;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
---	--

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/18/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: Reach 1, XS-10, Subpave 7/9 CM,EN

Date: 08-18-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 1.89", 1.38"
Total Weight: 2110.4g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2110.40	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	50.72	97.6
			0.5	323.32	84.7
			0.375	441.66	79.1
			#4	632.81	70.0
			#10	761.85	63.9
			#18	979.23	53.6
			#35	1333.77	36.8
			#60	1781.18	15.6
			#120	1979.56	6.2
			#230	2032.32	3.7

Fractional Components

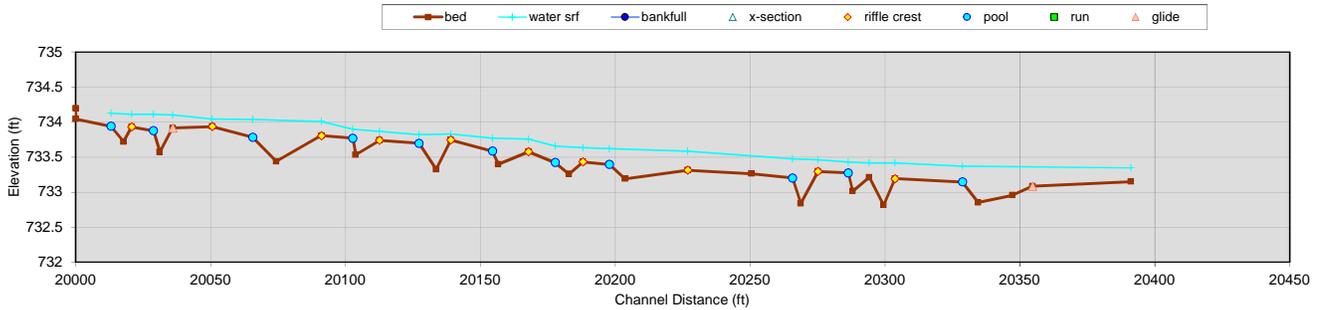
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	6.9	23.1	30.0	6.1	32.2	27.6	65.9			4.1

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.1853	0.2437	0.2947	0.4039	0.8377	1.4563	10.0254	12.8955	16.3166	21.1724

Fineness Modulus	C _u	C _c
3.66	7.86	0.60

Longitudinal Slope Profile

Candy Creek Reach 2

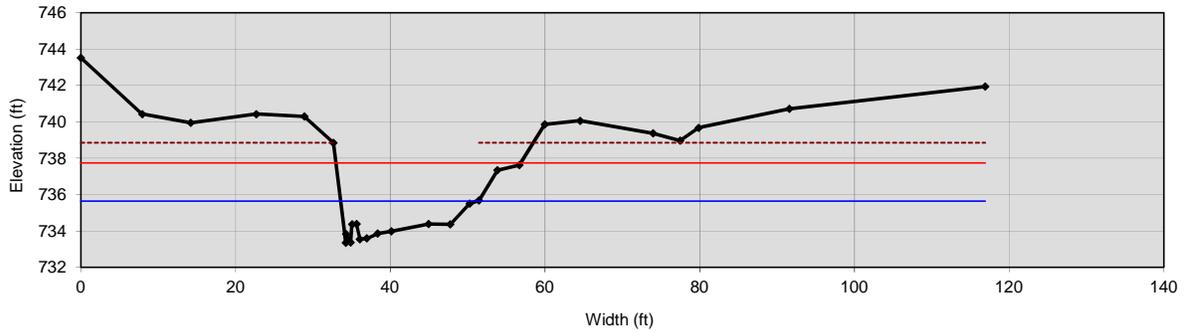


	slope (%)	slope ratio	length (ft)	length ratio	pool-pool spacing (ft)	p-p ratio
reach	0.25	---	20391.2 (1083 channel widths)	---	---	---
riffle	0.36 (0 - 0.98)	1.4 (0 - 3.9)	15.9 (8.1 - 38.9)	0.8 (0.4 - 2.1)	---	---
pool	0.15 (0 - 0.31)	0.6 (0 - 1.2)	15.2 (7.2 - 29)	0.8 (0.4 - 1.5)	31.6 (15.8 - 67)	1.7 (0.8 - 3.6)
glide	---	---	---	---	---	---
	0.4	1.6	14.7	0.8	---	---

notes	cross section ID	bed feature	BkF channel centerline				user defined					
			easting (ft)	northing (ft)	station	ELEV centerline	ELEV thalweg	ELEV water	ELEV bankfull	ELEV LTB	ELEV RTB	ELEV c
(TWG)TWG					20000.0		734.194					737.709
(TWG)TWG					20000.1		734.044				736.028	740.841
(TWG)TWG		P			20013.1		733.941	734.125				
(TWG)TWG					20017.8		733.719				736.719	
(TWG)TWG		R			20020.8		733.931	734.113			740.326	
(TWG)TWG		P			20028.9		733.877	734.113			739.642	
(TWG)TWG					20031.3		733.572					
(TWG)TWG		G			20036.0		733.915	734.101				
(TWG)TWG		R			20050.7		733.934	734.042				740.585
(TWG)TWG		P			20065.6		733.783	734.037				740.324
(TWG)TWG					20074.5		733.437					
(TWG)TWG		R			20091.1		733.805	734.007				739.803
(TWG)TWG		P			20102.7		733.77	733.898				
(TWG)TWG					20103.8		733.533					740.331
(TWG)TWG		R			20112.7		733.741	733.867			738.6	
(TWG)TWG		P			20127.3		733.697	733.822			739.509	
(TWG)TWG					20133.7		733.325				740.32	
(TWG)TWG		R			20139.1		733.744	733.828				
(TWG)TWG		P			20154.5		733.586	733.769				
(TWG)TWG					20156.7		733.396					
(TWG)TWG		R			20167.9		733.575	733.755			739.045	
(TWG)TWG		P			20177.7		733.423	733.658				739.475
(TWG)TWG					20182.9		733.259					739.973
(TWG)TWG		R			20188.0		733.43	733.633				
(TWG)TWG		P			20197.8		733.395	733.619				
(TWG)TWG					20203.7		733.191					740.224
(TWG)TWG		R			20226.9		733.312	733.586			738.387	736.99
(TWG)TWG					20250.5		733.264				739.704	
(TWG)TWG		P			20265.7		733.201	733.474			739.228	
(TWG)TWG					20268.8		732.838				739.157	
(TWG)TWG		R			20275.2		733.295	733.46				737.62
(TWG)TWG		P			20286.4		733.275	733.428				736.565
(TWG)TWG					20288.0		733.014					
(TWG)TWG					20294.2		733.21	733.418			737.427	
(TWG)TWG					20299.5		732.812					736.451
(TWG)TWG		R			20303.8		733.193	733.418				
(TWG)TWG		P			20328.7		733.144	733.37				
(TWG)TWG					20334.6		732.852				739.208	
(TWG)TWG					20347.2		732.954					
(TWG)TWG		G			20354.7		733.084					736.401
(TWG)TWG					20391.2		733.149	733.346			734.777	

Cross Section 7

Candy Creek Reach 2, pool



Bankfull Dimensions

23.8	x-section area (ft.sq.)
17.6	width (ft)
1.4	mean depth (ft)
2.3	max depth (ft)
21.5	wetted parimeter (ft)
1.1	hyd radi (ft)
13.0	width-depth ratio

Flood Dimensions

23.9	W flood prone area (ft)
1.4	entrenchment ratio
5.5	low bank height (ft)
2.4	low bank height ratio

Materials

1.8	D50 Riffle (mm)
11	D84 Riffle (mm)
8	threshold grain size (mm):

Bankfull Flow

3.6	velocity (ft/s)
85.0	discharge rate (cfs)
0.60	Froude number

Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
12.0	resistance factor u/u*
37.5	relative roughness

Forces & Power

0.25	channel slope (%)
0.17	shear stress (lb/sq.ft.)
0.30	shear velocity (ft/s)
0.75	unit strm power (lb/ft/s)

Cross Section

reference ID
 longitudinal station
 alignment
 feature

Bankfull Stage

elevation ---

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"
 D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	743.515	<input type="checkbox"/>	(XS7)XS7
			740.426	<input type="checkbox"/>	(XS7)XS7
			739.945	<input type="checkbox"/>	(XS7)XS7
			740.425	<input type="checkbox"/>	(XS7)XS7
			740.291	<input type="checkbox"/>	(XS7)XS7
			738.85	<input type="checkbox"/>	(XS7 LTB)XS7
			733.356	<input type="checkbox"/>	(XS7 TWG)XS7
			733.814	<input type="checkbox"/>	(XS7 WSF)XS7
			733.373	<input type="checkbox"/>	(XS7)XS7
			734.366	<input type="checkbox"/>	(XS7)XS7
			734.374	<input type="checkbox"/>	(XS7)XS7
			733.532	<input type="checkbox"/>	(XS7)XS7
			733.596	<input type="checkbox"/>	(XS7)XS7
			733.847	<input type="checkbox"/>	(XS7 REW)XS7
			733.982	<input type="checkbox"/>	(XS7)XS7
			734.385	<input type="checkbox"/>	(XS7)XS7
			734.362	<input type="checkbox"/>	(XS7)XS7
			735.508	<input type="checkbox"/>	(XS7)XS7
			735.679	<input type="checkbox"/>	(XS7 RBKF)XS7
			737.332	<input type="checkbox"/>	(XS7 RLB)XS7
			737.623	<input type="checkbox"/>	(XS7)XS7
			739.861	<input type="checkbox"/>	(XS7 RTB)XS7
			740.057	<input type="checkbox"/>	(XS7)XS7
			739.371	<input type="checkbox"/>	(XS7)XS7
			738.963	<input type="checkbox"/>	(XS7)XS7
			739.673	<input type="checkbox"/>	(XS7)XS7
			740.708	<input type="checkbox"/>	(XS7)XS7
			741.937	<input type="checkbox"/>	(XS7 POOL)
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Reachwide and Cross Section Pebble Count Plots

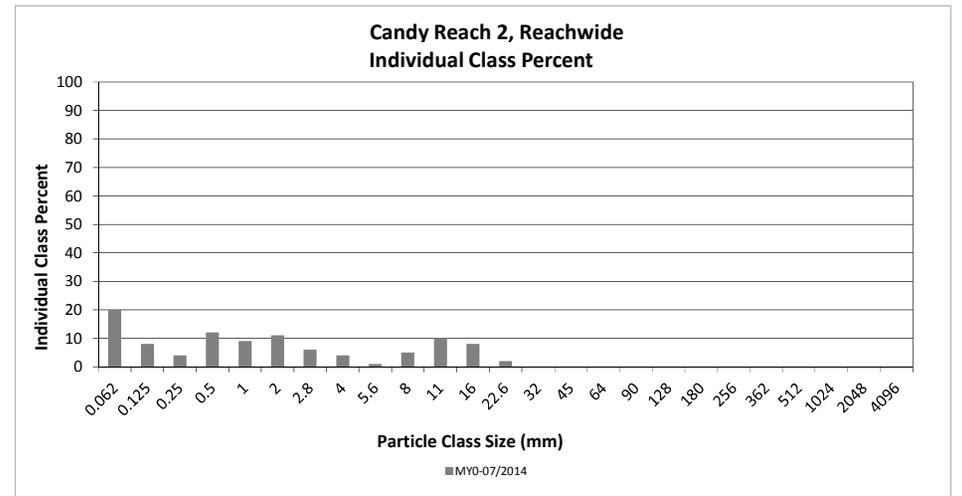
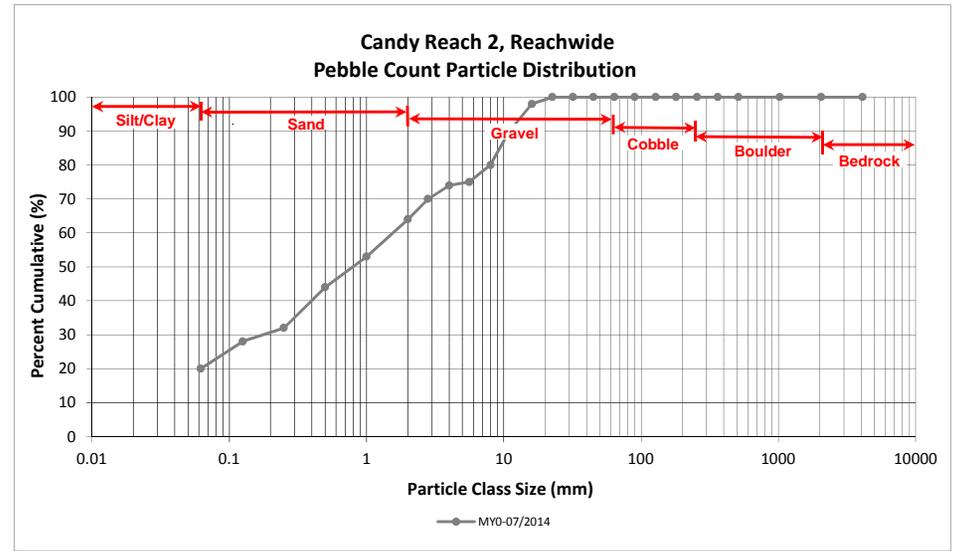
Candy Creek Mitigation Site

Existing Conditions - 2014

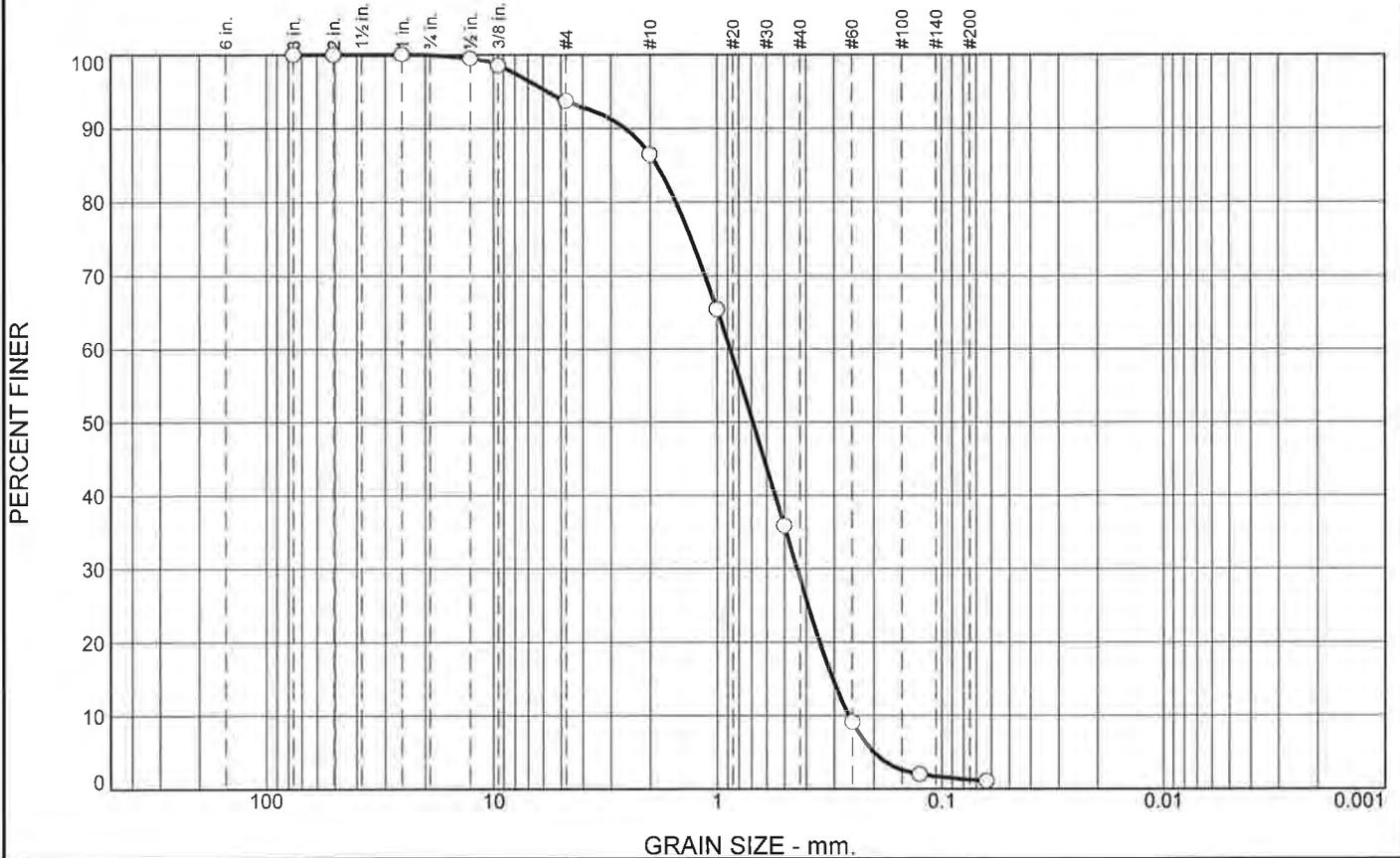
Candy Reach 2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	14	20	20	20
SAND	Very fine	0.062	0.125	2	6	8	8	28
	Fine	0.125	0.250	1	3	4	4	32
	Medium	0.25	0.50	9	3	12	12	44
	Coarse	0.5	1.0	6	3	9	9	53
	Very Coarse	1.0	2.0	7	4	11	11	64
GRAVEL	Very Fine	2.0	2.8	3	3	6	6	70
	Very Fine	2.8	4.0	4		4	4	74
	Fine	4.0	5.6	1		1	1	75
	Fine	5.6	8.0	3	2	5	5	80
	Medium	8.0	11.0	8	2	10	10	90
	Medium	11.0	16.0	8		8	8	98
	Coarse	16.0	22.6	2		2	2	100
	Coarse	22.6	32					100
	Very Coarse	32	45					100
	Very Coarse	45	64					100
COBBLE	Small	64	90					100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				60	40	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.30
D ₅₀ =	0.8
D ₈₄ =	9.1
D ₉₅ =	13.9
D ₁₀₀ =	22.6



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.1	6.2	7.3	57.9	27.2	1.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	100.0		
0.5	99.4		
0.375	98.5		
#4	93.7		
#10	86.4		
#18	65.4		
#35	35.8		
#60	9.1		
#120	2.0		
#230	1.1		

(no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 2.5843 D₈₅= 1.8659 D₆₀= 0.8732

D₅₀= 0.6887 D₃₀= 0.4394 D₁₅= 0.3041

D₁₀= 0.2589 C_u= 3.37 C_c= 0.85

USCS= SP **Classification** AASHTO=

Remarks

Secondary Axis: 0.86", 0.75"
Total Weight: 1593.38g

Location: Reach 2 Subpave/Pave Grab Sample 7/9 CM,ENSG X-58

Date: 08-18-14

<p style="text-align: center; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p>
<p>Figure</p>	

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: Reach 2 Subpave/Pave Grab Sample 7/9 CM,ENSG X-58

Date: 08-18-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 0.86", 0.75"

Total WEight: 1593.38g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1593.38	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	0.00	100.0
			0.5	8.91	99.4
			0.375	23.80	98.5
			#4	101.11	93.7
			#10	216.70	86.4
			#18	551.31	65.4
			#35	1022.95	35.8
			#60	1448.38	9.1
			#120	1561.51	2.0
			#230	1575.85	1.1

Fractional Components

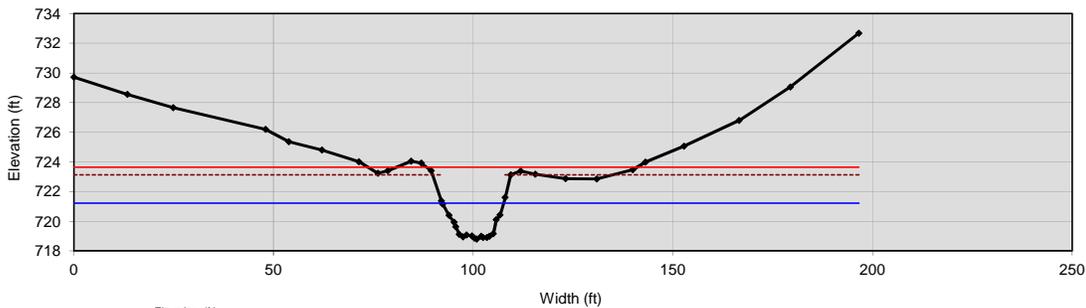
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	6.2	6.3	7.3	57.9	27.2	92.4			1.3

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.2589	0.3041	0.3475	0.4394	0.6887	0.8732	1.5306	1.8659	2.5843	5.7864

Fineness Modulus	C _u	C _c
2.86	3.37	0.85

Cross Section 4

Candy Creek Reach 3, riffle



Bankfull Dimensions		Flood Dimensions		Materials	
22.5	x-section area (ft.sq.)	59.8	W flood prone area (ft)	6.4	D50 Riffle (mm)
13.9	width (ft)	4.3	entrenchment ratio	76	D84 Riffle (mm)
1.6	mean depth (ft)	4.3	low bank height (ft)	20	threshold grain size (mm):
2.4	max depth (ft)	1.8	low bank height ratio		
15.3	wetted perimeter (ft)				
1.5	hyd radi (ft)				
8.5	width-depth ratio				

Bankfull Flow		Flow Resistance		Forces & Power	
3.5	velocity (ft/s)	0.036	Manning's roughness	0.436	channel slope (%)
78.8	discharge rate (cfs)	0.14	D'Arcy-Weisbach fric.	0.40	shear stress (lb/sq.ft.)
0.51	Froude number	7.7	resistance factor u/u*	0.45	shear velocity (ft/s)
		6.5	relative roughness	1.55	unit strm power (lb/ft/s)

Cross Section

reference ID: 4
 longitudinal station: ---
 alignment: straight line
 feature: ---

Bankfull Stage

elevation: 721.22

Low Bank Height

elevation: 723.124

Flood Prone Area

width fpa: 59.8

Channel Slope

percent slope: 0.436

Flow Resistance

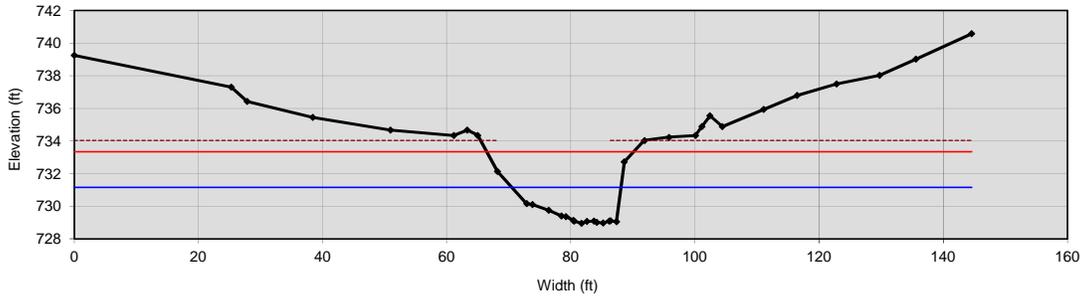
Manning's "n": 0.036
 D'Arcy - Weisbach "f": 0.14

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	729.716	<input type="checkbox"/>	(XS4)XS4
		13.40	728.549	<input type="checkbox"/>	(XS4)XS4
		24.91	727.647	<input type="checkbox"/>	(XS4)XS4
		48.01	726.194	<input type="checkbox"/>	(XS4)XS4
		53.84	725.357	<input type="checkbox"/>	(XS4)XS4
		62.13	724.808	<input type="checkbox"/>	(XS4)XS4
		71.40	724	<input type="checkbox"/>	(XS4)XS4
		76.17	723.245	<input type="checkbox"/>	(XS4)XS4
		78.67	723.407	<input type="checkbox"/>	(XS4)XS4
		84.47	724.054	<input type="checkbox"/>	(XS4)XS4
		86.98	723.932	<input type="checkbox"/>	(XS4)XS4
		89.48	723.408	<input type="checkbox"/>	(XS4 LTB)XS4
		92.02	721.368	<input type="checkbox"/>	(XS4)XS4
		92.38	721.164	<input type="checkbox"/>	(XS4)XS4
		93.91	720.413	<input type="checkbox"/>	(XS4)XS4
		95.21	719.942	<input type="checkbox"/>	(XS4 LBKF)XS4
		95.64	719.628	<input type="checkbox"/>	(XS4)XS4
		96.50	719.129	<input type="checkbox"/>	(XS4)XS4
		97.42	718.95	<input type="checkbox"/>	(XS4)XS4
		98.33	719.074	<input type="checkbox"/>	(XS4)XS4
		99.71	719.021	<input type="checkbox"/>	(XS4 LEW)XS4
		100.36	718.872	<input type="checkbox"/>	(XS4)XS4
		100.91	718.794	<input type="checkbox"/>	(XS4 TWG)XS4
		101.97	718.985	<input type="checkbox"/>	(XS4)XS4
		102.50	718.908	<input checked="" type="checkbox"/>	(XS4)XS4
		103.40	718.9	<input type="checkbox"/>	(XS4)XS4
		104.07	718.993	<input type="checkbox"/>	(XS4 REW)XS4
		105.05	719.17	<input type="checkbox"/>	(XS4)XS4
		105.76	720.1	<input type="checkbox"/>	(XS4)XS4
		106.73	720.435	<input type="checkbox"/>	(XS4)XS4
		108.00	721.613	<input type="checkbox"/>	(XS4)XS4
		109.40	723.124	<input type="checkbox"/>	(XS4 RTB)XS4
		111.85	723.388	<input checked="" type="checkbox"/>	(XS4)XS4
		115.52	723.181	<input checked="" type="checkbox"/>	(XS4)XS4
		123.12	722.87	<input checked="" type="checkbox"/>	(XS4)XS4
		130.95	722.849	<input checked="" type="checkbox"/>	(XS4)XS4
		139.94	723.48	<input checked="" type="checkbox"/>	(XS4)XS4
		143.13	723.985	<input checked="" type="checkbox"/>	(XS4)XS4
		152.80	725.059	<input checked="" type="checkbox"/>	(XS4)XS4
		166.61	726.794	<input checked="" type="checkbox"/>	(XS4)XS4
		179.43	729.059	<input checked="" type="checkbox"/>	(XS4)XS4
		196.57	732.673	<input checked="" type="checkbox"/>	(XS4 RIFFLE)

Cross Section 5

Candy Creek Reach 3, riffle



Bankfull Dimensions

24.8	x-section area (ft.sq.)
15.9	width (ft)
1.6	mean depth (ft)
2.2	max depth (ft)
16.2	wetted perimeter (ft)
1.5	hyd radi (ft)
10.2	width-depth ratio

Flood Dimensions

23.7	W flood prone area (ft)
1.5	entrenchment ratio
5.1	low bank height (ft)
2.3	low bank height ratio

Materials

6.4	D50 Riffle (mm)
76	D84 Riffle (mm)
20	threshold grain size (mm):

Bankfull Flow

3.6	velocity (ft/s)
88.7	discharge rate (cfs)
0.51	Froude number

Flow Resistance

0.037	Manning's roughness
0.14	D'Arcy-Weisbach fric.
7.7	resistance factor u/u*
6.3	relative roughness

Forces & Power

0.436	channel slope (%)
0.42	shear stress (lb/sq.ft.)
0.46	shear velocity (ft/s)
1.52	unit strm power (lb/ft/s)

Cross Section

reference ID: 5
 longitudinal station: ---
 alignment: straight line
 feature: ---

Bankfull Stage

elevation: 731.15

Low Bank Height

elevation: 734.032

Flood Prone Area

width fpa: 23.7

Channel Slope

percent slope: 0.436

Flow Resistance

Manning's "n": 0.037
 D'Arcy - Weisbach "f": 0.14

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	739.26	<input type="checkbox"/>	(XS5)XS5
		25.31	737.309	<input type="checkbox"/>	(XS5)XS5
		27.84	736.429	<input type="checkbox"/>	(XS5)XS5
		38.40	735.446	<input type="checkbox"/>	(XS5)XS5
		50.96	734.671	<input type="checkbox"/>	(XS5)XS5
		61.12	734.329	<input type="checkbox"/>	(XS5)XS5
		63.31	734.664	<input type="checkbox"/>	(XS5)XS5
		64.99	734.345	<input type="checkbox"/>	(XS5 LTB)XS5
		68.16	732.123	<input type="checkbox"/>	(XS5)XS5
		72.87	730.151	<input type="checkbox"/>	(XS5)XS5
		73.83	730.096	<input type="checkbox"/>	(XS5)XS5
		76.44	729.75	<input type="checkbox"/>	(XS5)XS5
		78.49	729.399	<input type="checkbox"/>	(XS5)XS5
		79.22	729.365	<input type="checkbox"/>	(XS5)XS5
		80.39	729.115	<input type="checkbox"/>	(XS5)XS5
		80.53	729.089	<input type="checkbox"/>	(XS5 LEW)X
		81.71	728.954	<input type="checkbox"/>	(XS5 TWG)X
		82.60	729.057	<input type="checkbox"/>	(XS5)XS5
		83.72	729.086	<input type="checkbox"/>	(XS5)XS5
		84.18	729.007	<input type="checkbox"/>	(XS5)XS5
		85.20	728.966	<input type="checkbox"/>	(XS5)XS5
		86.16	729.084	<input type="checkbox"/>	(XS5 REW)X
		86.38	729.098	<input type="checkbox"/>	(XS5)XS5
		87.34	729.047	<input checked="" type="checkbox"/>	(XS5)XS5
		88.59	732.713	<input type="checkbox"/>	(XS5)XS5
		91.85	734.032	<input type="checkbox"/>	(XS5 RTB)XS5
		95.80	734.227	<input type="checkbox"/>	(XS5)XS5
		100.06	734.341	<input type="checkbox"/>	(XS5)XS5
		101.09	734.886	<input type="checkbox"/>	(XS5)XS5
		102.38	735.537	<input type="checkbox"/>	(XS5)XS5
		104.39	734.875	<input type="checkbox"/>	(XS5)XS5
		111.07	735.941	<input type="checkbox"/>	(XS5)XS5
		116.46	736.789	<input type="checkbox"/>	(XS5)XS5
		122.78	737.489	<input type="checkbox"/>	(XS5)XS5
		129.71	738.027	<input type="checkbox"/>	(XS5)XS5
		135.58	739.011	<input type="checkbox"/>	(XS5)XS5
		144.56	740.584	<input type="checkbox"/>	(XS5 RIFFLE)

Reachwide and Cross Section Pebble Count Plots

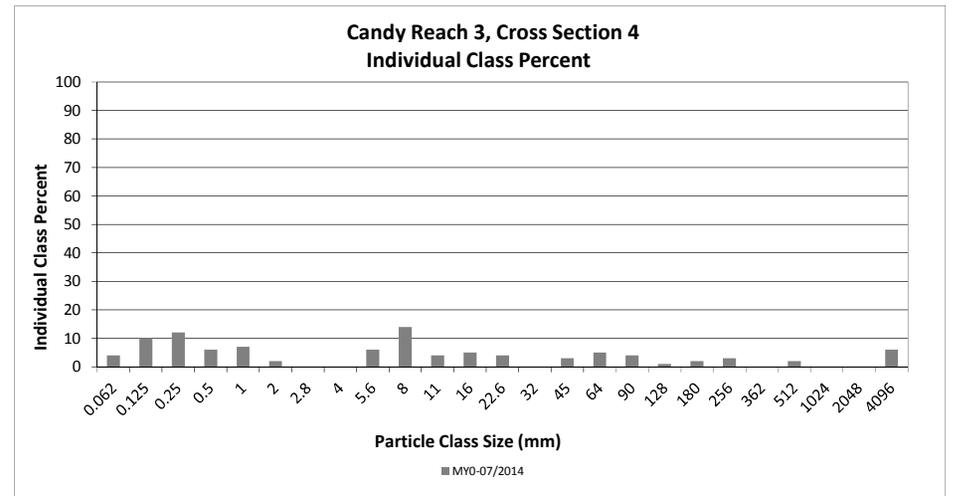
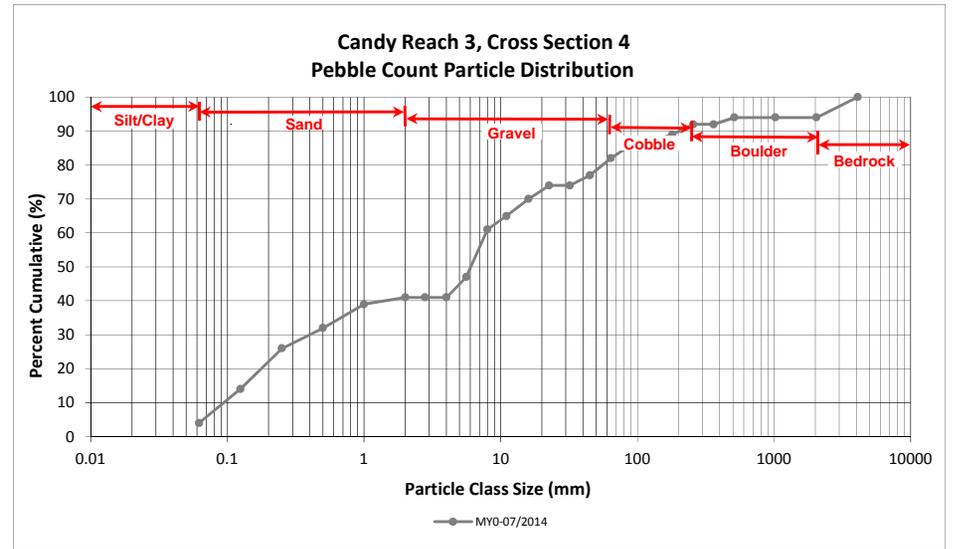
Candy Creek Mitigation Site

Existing Conditions - 2014

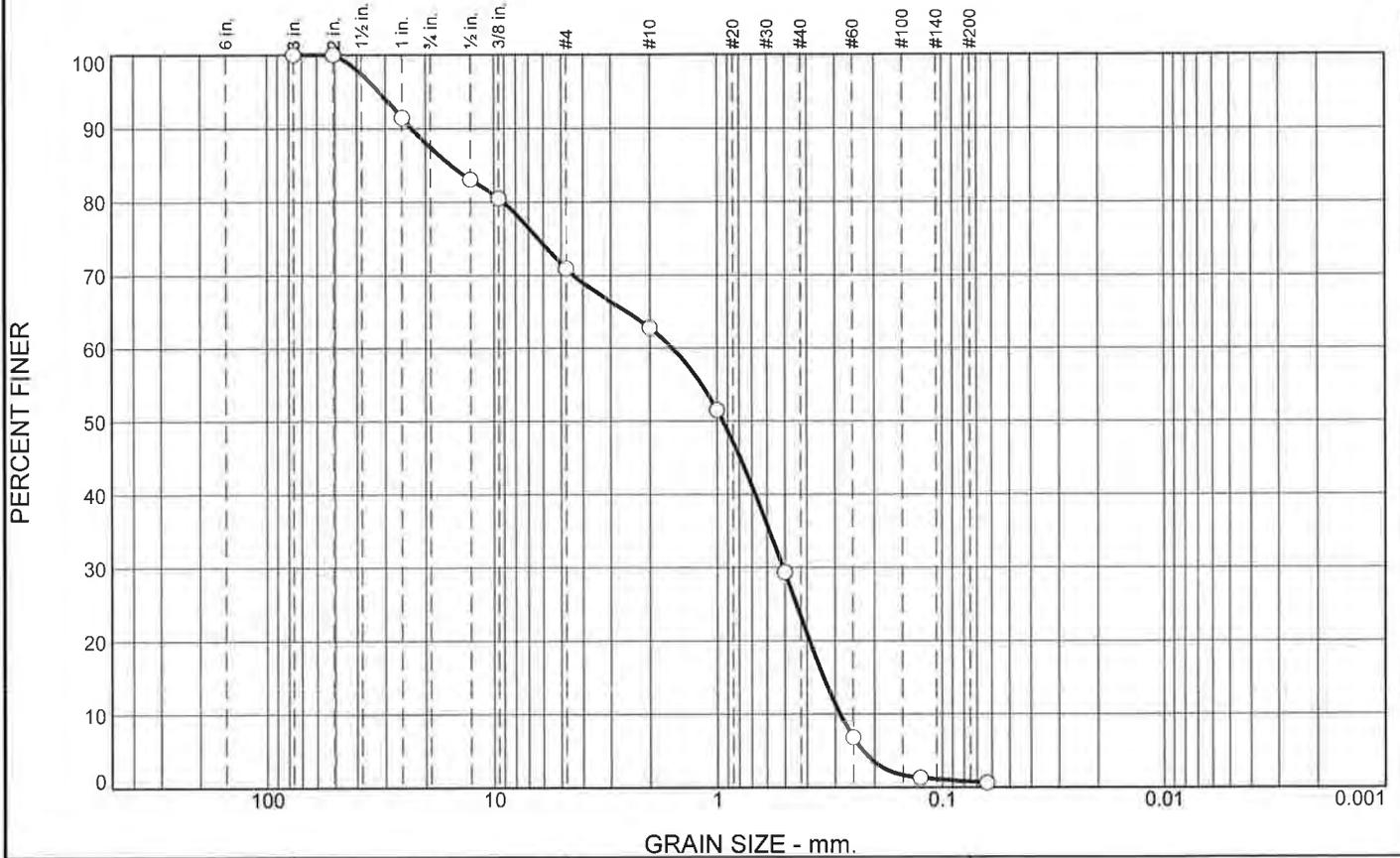
Candy Reach 3, Cross Section 4

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125	10	10	14
	Fine	0.125	0.250	12	12	26
	Medium	0.25	0.50	6	6	32
	Coarse	0.5	1.0	7	7	39
	Very Coarse	1.0	2.0	2	2	41
GRAVEL	Very Fine	2.0	2.8			41
	Very Fine	2.8	4.0			41
	Fine	4.0	5.6	6	6	47
	Fine	5.6	8.0	14	14	61
	Medium	8.0	11.0	4	4	65
	Medium	11.0	16.0	5	5	70
	Coarse	16.0	22.6	4	4	74
	Coarse	22.6	32			74
	Very Coarse	32	45	3	3	77
	Very Coarse	45	64	5	5	82
COBBLE	Small	64	90	4	4	86
	Small	90	128	1	1	87
	Large	128	180	2	2	89
	Large	180	256	3	3	92
BOULDER	Small	256	362			92
	Small	362	512	2	2	94
	Medium	512	1024			94
	Large/Very Large	1024	2048			94
BEDROCK	Bedrock	2048	>2048	6	6	100
Total				100	100	100

Cross Section 4	
Channel materials (mm)	
D ₁₆ =	0.14
D ₃₅ =	0.67
D ₅₀ =	6.0
D ₈₄ =	75.9
D ₉₅ =	2298.8
D ₁₀₀ =	>2048



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.6	16.5	8.2	39.5	22.4	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	91.4		
0.5	83.0		
0.375	80.5		
#4	70.9		
#10	62.7		
#18	51.5		
#35	29.3		
#60	6.8		
#120	1.3		
#230	0.6		

Material Description

Atterberg Limits
 PL= LL= PI=

Coefficients
 D₉₀= 23.0895 D₈₅= 15.5964 D₆₀= 1.5881
 D₅₀= 0.9421 D₃₀= 0.5095 D₁₅= 0.3369
 D₁₀= 0.2856 C_u= 5.56 C_c= 0.57

Classification
 USCS= SP AASHTO=

Remarks
 Secondary Axis: 2.10", 1.91"
 Total Weight: 1621.12g

* (no specification provided)

Location: Reach 3, XS-4

Date: 08-18-14

<p style="text-align: center; font-weight: bold; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
---	--

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/18/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: Reach 3, XS-4

Date: 08-18-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 2.10", 1.91"

Total Weight: 1621.12g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1621.12	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	139.38	91.4
			0.5	275.94	83.0
			0.375	316.41	80.5
			#4	471.68	70.9
			#10	604.70	62.7
			#18	786.20	51.5
			#35	1146.10	29.3
			#60	1510.90	6.8
			#120	1600.00	1.3
			#230	1611.40	0.6

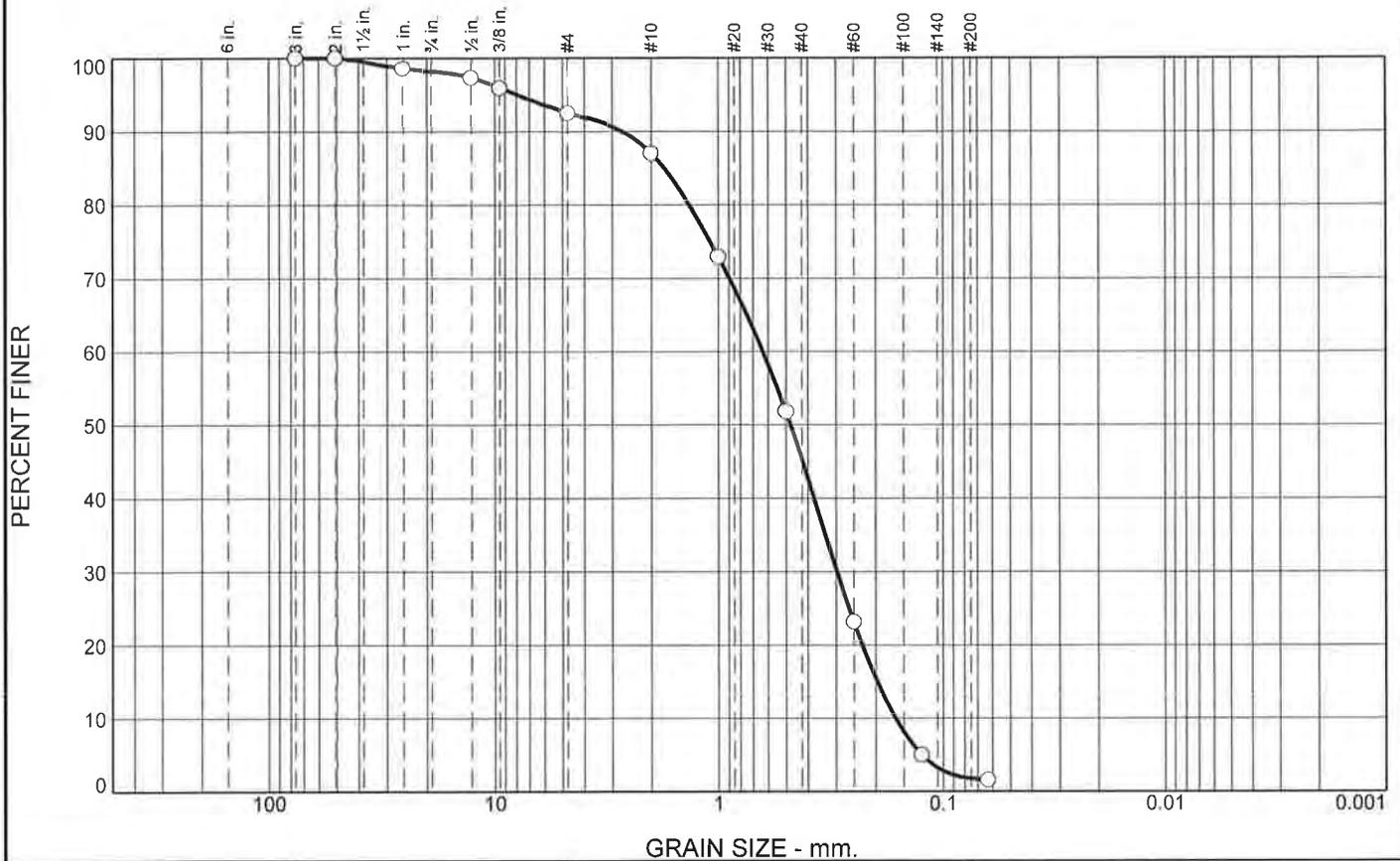
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	12.6	16.5	29.1	8.2	39.5	22.4	70.1			0.8

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.2856	0.3369	0.3891	0.5095	0.9421	1.5881	9.1099	15.5964	23.0895	32.1633

Fineness Modulus	C _u	C _c
3.96	5.56	0.57

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.9	5.6	5.5	41.7	43.5	1.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	98.5		
0.5	97.2		
0.375	95.9		
#4	92.5		
#10	87.0		
#18	72.9		
#35	51.8		
#60	23.1		
#120	5.0		
#230	1.6		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 2.7122 D₈₅= 1.7504 D₆₀= 0.6320

D₅₀= 0.4773 D₃₀= 0.2972 D₁₅= 0.1968

D₁₀= 0.1633 C_u= 3.87 C_c= 0.86

USCS= SP **Classification** AASHTO=

Remarks

Secondary Axis: 1.18", 0.95"

Total Weight: 1195.86g

Location: Reach 3, XS-5 Riffle

Date: 08-11-14

<p style="text-align: center; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
---	--

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: Reach 3, XS-5 Riffle

Date: 08-11-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 1.18", 0.95"

Total Weight: 1195.86g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1195.86	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	17.76	98.5
			0.5	33.08	97.2
			0.375	48.80	95.9
			#4	89.51	92.5
			#10	155.46	87.0
			#18	324.08	72.9
			#35	576.40	51.8
			#60	919.62	23.1
			#120	1136.07	5.0
			#230	1176.73	1.6

Fractional Components

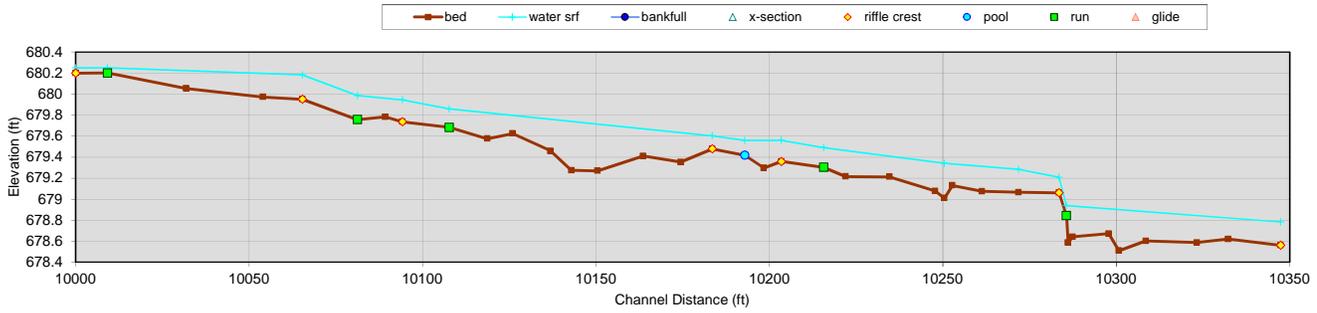
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.9	5.6	7.5	5.5	41.7	43.5	90.7			1.8

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.1633	0.1968	0.2296	0.2972	0.4773	0.6320	1.3505	1.7504	2.7122	7.9881

Fineness Modulus	C _u	C _c
2.51	3.87	0.86

Longitudinal Slope Profile

Candy Creek Reach 4

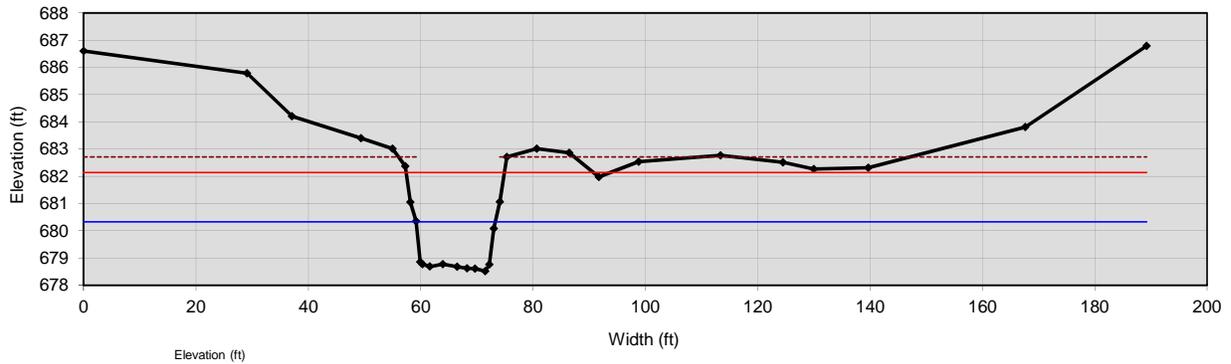


	slope (%)	slope ratio	length (ft)	length ratio	pool-pool spacing (ft)	p-p ratio
reach	0.42	---	10347.4 (812.4 channel widths	---	---	---
riffle	2.7 (0 - 13)	6.4 (0 - 31)	10.4 (2 - 15.9)	0.8 (0.2 - 1.2)	---	---
pool	0	0	10.5	0.8	---	---
run	0.29 (0.12 - 0.42)	0.7 (0.3 - 1)	54.9 (13 - 75.9)	4.3 (1 - 6)	---	---
	---	---	---	---	---	---

notes	cross section ID	bed feature	BkF channel centerline				ELEV			user defined		
			easting (ft)	northing (ft)	station	centerline	thalweg	water	bankfull	a	b	c
(TWG HOR)TWG HOR		r			10000.0		680.199	680.249				
(TWG TOR)TWG TOR		n			10009.2		680.201	680.249				
(TWG)TWG					10031.9		680.053					
(TWG)TWG					10054.1		679.972					
(TWG HOR)TWG HOR		r			10065.4		679.95	680.183				
(TWG TOR)TWG TOR		n			10081.3		679.756	679.985				
(TWG)TWG					10089.3		679.782					
(TWG HOR)TWG HOR		r			10094.2		679.736	679.944				
(TWG TOR)TWG TOR		n			10107.7		679.683	679.858				
(TWG)TWG					10118.7		679.575					
(TWG)TWG					10126.0		679.623					
(TWG)TWG					10136.9		679.458					
(TWG)TWG					10142.9		679.274					
(TWG)TWG					10150.5		679.269					
(TWG)TWG					10163.6		679.41					
(TWG)TWG					10174.5		679.352					
(TWG HOR)TWG HOR		r			10183.6		679.478	679.602				
(TWG TOR)TWG TOR		p			10192.9		679.417	679.558				
(TWG)TWG					10198.4		679.296					
(TWG HOR)TWG HOR		r			10203.5		679.359	679.56				
(TWG TOR)TWG TOR		n			10215.7		679.303	679.49				
(TWG)TWG					10222.0		679.214					
(TWG)TWG					10234.7		679.211					
(TWG)TWG					10247.8		679.077					
(TWG MP)TWG MP					10250.4		679.009	679.34				
(TWG)TWG					10252.7		679.129					
(TWG)TWG					10261.3		679.074					
(TWG)TWG					10271.8		679.064	679.283				
(TWG HOR BROCK)TWG HOR BROCK		r			10283.5		679.06	679.207				
(TWG TOR BROCK)TWG TOR BROCK		n			10285.6		678.843	678.939				
(TWG MP BROCK)TWG MP BROCK					10286.1		678.585					
(TWG)TWG					10287.4		678.64					
(TWG)TWG					10297.9		678.671					
(TWG MP BROCK)TWG MP BROCK					10300.8		678.508					
(TWG)TWG					10308.5		678.601					
(TWG)TWG					10323.3		678.586					
(TWG)TWG					10332.3		678.619					
(TWG HOR)TWG HOR		r			10347.4		678.56	678.782				

Cross Section 1

Candy Creek Reach 4, riffle



Bankfull Dimensions	
21.5	x-section area (ft.sq.)
14.1	width (ft)
1.5	mean depth (ft)
1.8	max depth (ft)
15.9	wetted parimeter (ft)
1.4	hyd radi (ft)
9.2	width-depth ratio

Flood Dimensions	
20.5	W flood prone area (ft)
1.5	entrenchment ratio
4.2	low bank height (ft)
2.3	low bank height ratio

Materials	
2.1	D50 Riffle (mm)
15	D84 Riffle (mm)
17	threshold grain size (mm):

Bankfull Flow	
4.9	velocity (ft/s)
105.0	discharge rate (cfs)
0.74	Froude number

Flow Resistance	
0.024	Manning's roughness
0.06	D'Arcy-Weisbach fric.
11.4	resistance factor u/u*
31.1	relative roughness

Forces & Power	
0.42	channel slope (%)
0.36	shear stress (lb/sq.ft.)
0.43	shear velocity (ft/s)
1.96	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	686.608	<input type="checkbox"/>	(XS1) RIFFLE
			685.789	<input type="checkbox"/>	(XS1)XS1
			684.206	<input type="checkbox"/>	(XS1)XS1
			683.402	<input type="checkbox"/>	(XS1)XS1
			683.022	<input type="checkbox"/>	(XS1)LTB)XS
			682.377	<input type="checkbox"/>	(XS1)XS1
			681.057	<input type="checkbox"/>	(XS1)XS1
			680.359	<input type="checkbox"/>	(XS1)XS1
			678.86	<input type="checkbox"/>	(XS1)LCH)XS
			678.776	<input type="checkbox"/>	(XS1)LEW)X
			678.69	<input type="checkbox"/>	(XS1)XS1
			678.777	<input type="checkbox"/>	(XS1)XS1
			678.679	<input type="checkbox"/>	(XS1)XS1
			678.63	<input type="checkbox"/>	(XS1)XS1
			678.613	<input type="checkbox"/>	(XS1)TWG)X
			678.52	<input type="checkbox"/>	(XS1)XS1
			678.765	<input type="checkbox"/>	(XS1)REWR
			680.091	<input type="checkbox"/>	(XS1)XS1
			681.069	<input type="checkbox"/>	(XS1)XS1
			682.712	<input type="checkbox"/>	(XS1)RTB)XS
			683.015	<input checked="" type="checkbox"/>	(XS1)XS1
			682.867	<input checked="" type="checkbox"/>	(XS1)XS1
			681.98	<input checked="" type="checkbox"/>	(XS1)XS1
			682.541	<input checked="" type="checkbox"/>	(XS1)XS1
			682.776	<input checked="" type="checkbox"/>	(XS1)XS1
			682.514	<input checked="" type="checkbox"/>	(XS1)XS1
			682.273	<input checked="" type="checkbox"/>	(XS1)XS1
			682.314	<input checked="" type="checkbox"/>	(XS1)XS1
			683.812	<input checked="" type="checkbox"/>	(XS1)XS1
			686.785	<input checked="" type="checkbox"/>	(XS1)XS1

Reachwide and Cross Section Pebble Count Plots

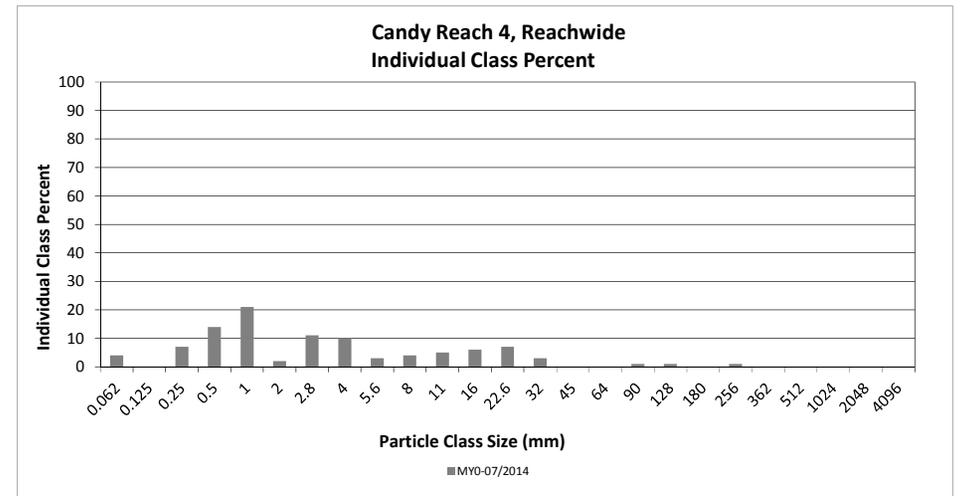
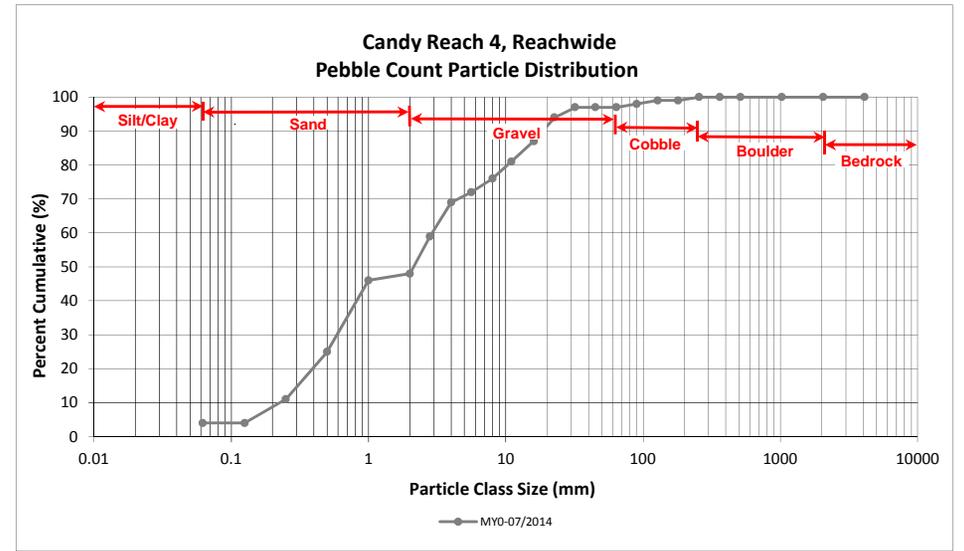
Candy Creek Mitigation Site

Existing Conditions - 2014

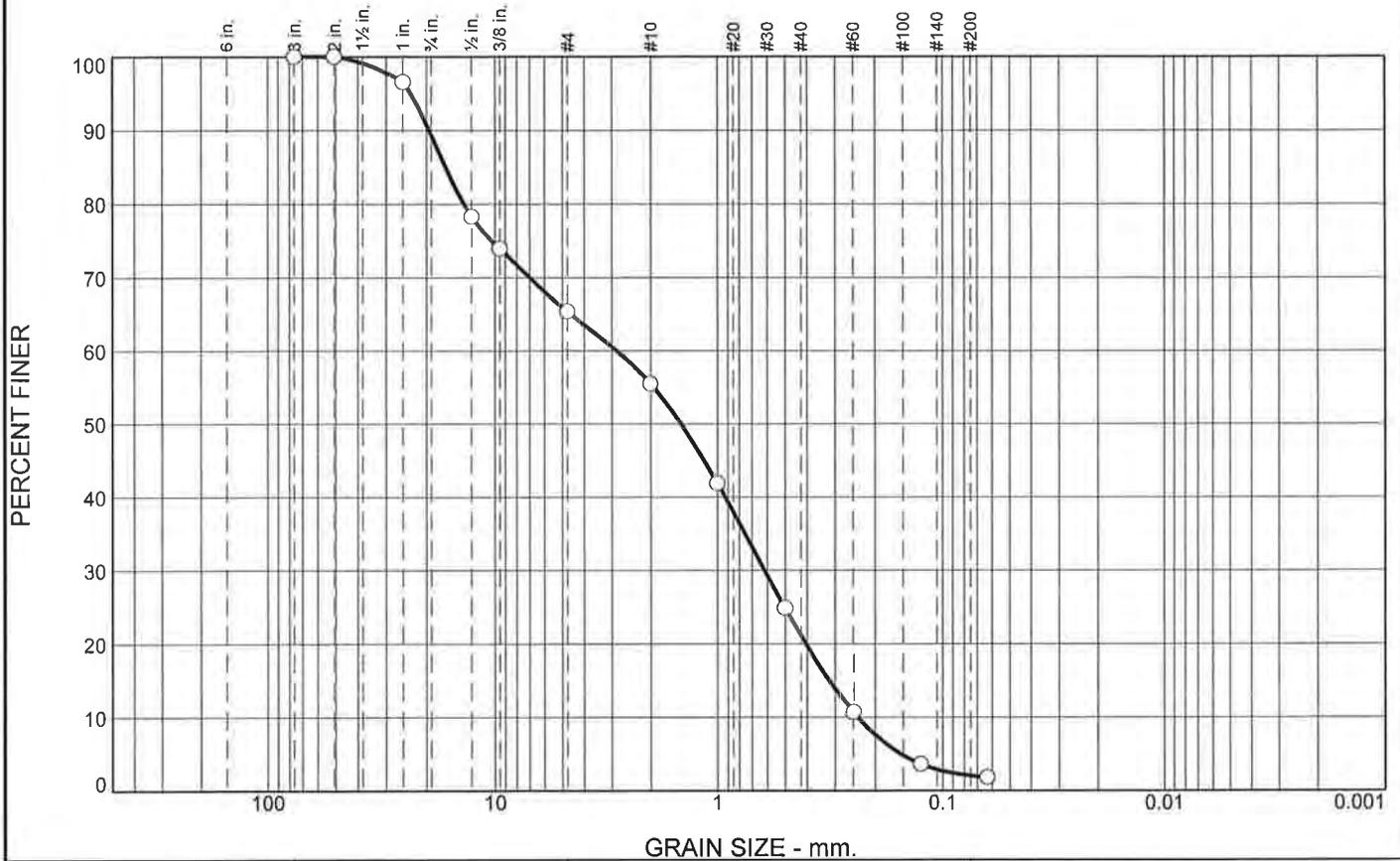
Candy Reach 4, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4		4	4	4
SAND	Very fine	0.062	0.125					4
	Fine	0.125	0.250	6	1	7	7	11
	Medium	0.25	0.50	10	4	14	14	25
	Coarse	0.5	1.0	18	3	21	21	46
	Very Coarse	1.0	2.0	2		2	2	48
GRAVEL	Very Fine	2.0	2.8	6	5	11	11	58
	Very Fine	2.8	4.0	8	2	10	10	68
	Fine	4.0	5.6	2	1	3	3	71
	Fine	5.6	8.0	4		4	4	75
	Medium	8.0	11.0	4	1	5	5	80
	Medium	11.0	16.0	5	1	6	6	86
	Coarse	16.0	22.6	7		7	7	93
	Coarse	22.6	32	1	2	3	3	96
	Very Coarse	32	45					96
	Very Coarse	45	64	1		1	1	97
COBBLE	Small	64	90	1		1	1	98
	Small	90	128	1		1	1	99
	Large	128	180					99
	Large	180	256	1		1	1	100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				81	20	101	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	0.32
D ₃₅ =	0.70
D ₅₀ =	2.2
D ₈₄ =	14.0
D ₉₅ =	28.3
D ₁₀₀ =	256.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.7	23.9	9.9	34.4	19.1	2.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	96.6		
0.5	78.3		
0.375	73.9		
#4	65.4		
#10	55.5		
#18	41.9		
#35	24.9		
#60	10.7		
#120	3.6		
#230	1.8		

Material Description

PL= **Atterberg Limits** LL= PI=

Coefficients

D₉₀= 19.4832 D₈₅= 16.4517 D₆₀= 2.8471
D₅₀= 1.4563 D₃₀= 0.6156 D₁₅= 0.3189
D₁₀= 0.2388 C_u= 11.92 C_c= 0.56

Classification

USCS= SP AASHTO=

Remarks

Secondary Axis: 1.42", 1.65"
Total Weight: 2657.95g

* (no specification provided)

Location: Reach 4 XS-1

Date: 08-18-14

<p style="text-align: center;">Summit Engineering</p> <p style="text-align: center;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering Project: Candy Creek Project No: SL-262-11</p>
<p>Figure</p>	

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: Reach 4 XS-1

Date: 08-18-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 1.42", 1.65"

Total Weight: 2657.95g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2657.95	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	91.25	96.6
			0.5	576.61	78.3
			0.375	692.59	73.9
			#4	920.91	65.4
			#10	1182.80	55.5
			#18	1544.30	41.9
			#35	1996.10	24.9
			#60	2373.60	10.7
			#120	2562.20	3.6
			#230	2610.10	1.8

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	10.7	23.9	34.6	9.9	34.4	19.1	63.4			2.0

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.2388	0.3189	0.4048	0.6156	1.4563	2.8471	13.6957	16.4517	19.4832	23.5511

Fineness Modulus	C _u	C _c
4.21	11.92	0.56

Reachwide and Cross Section Pebble Count Plots

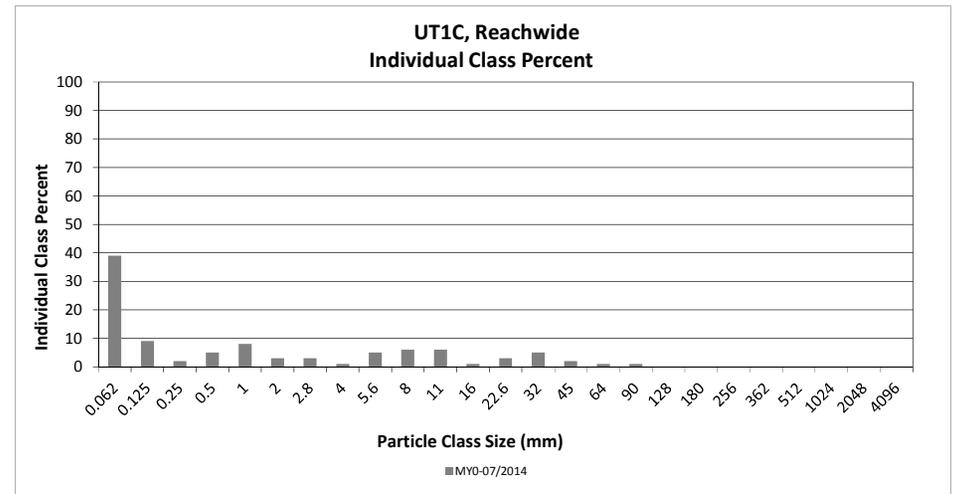
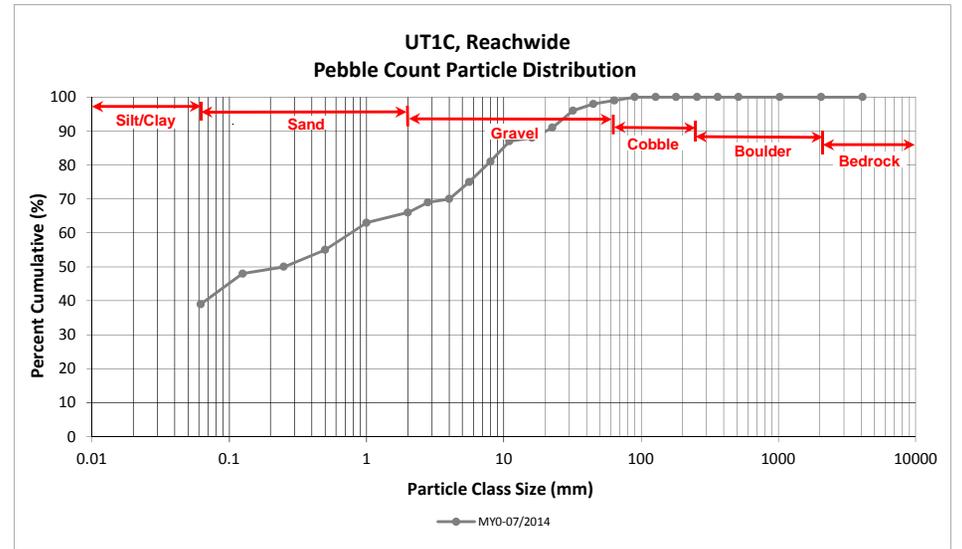
Candy Creek Mitigation Site

Existing Conditions - 2014

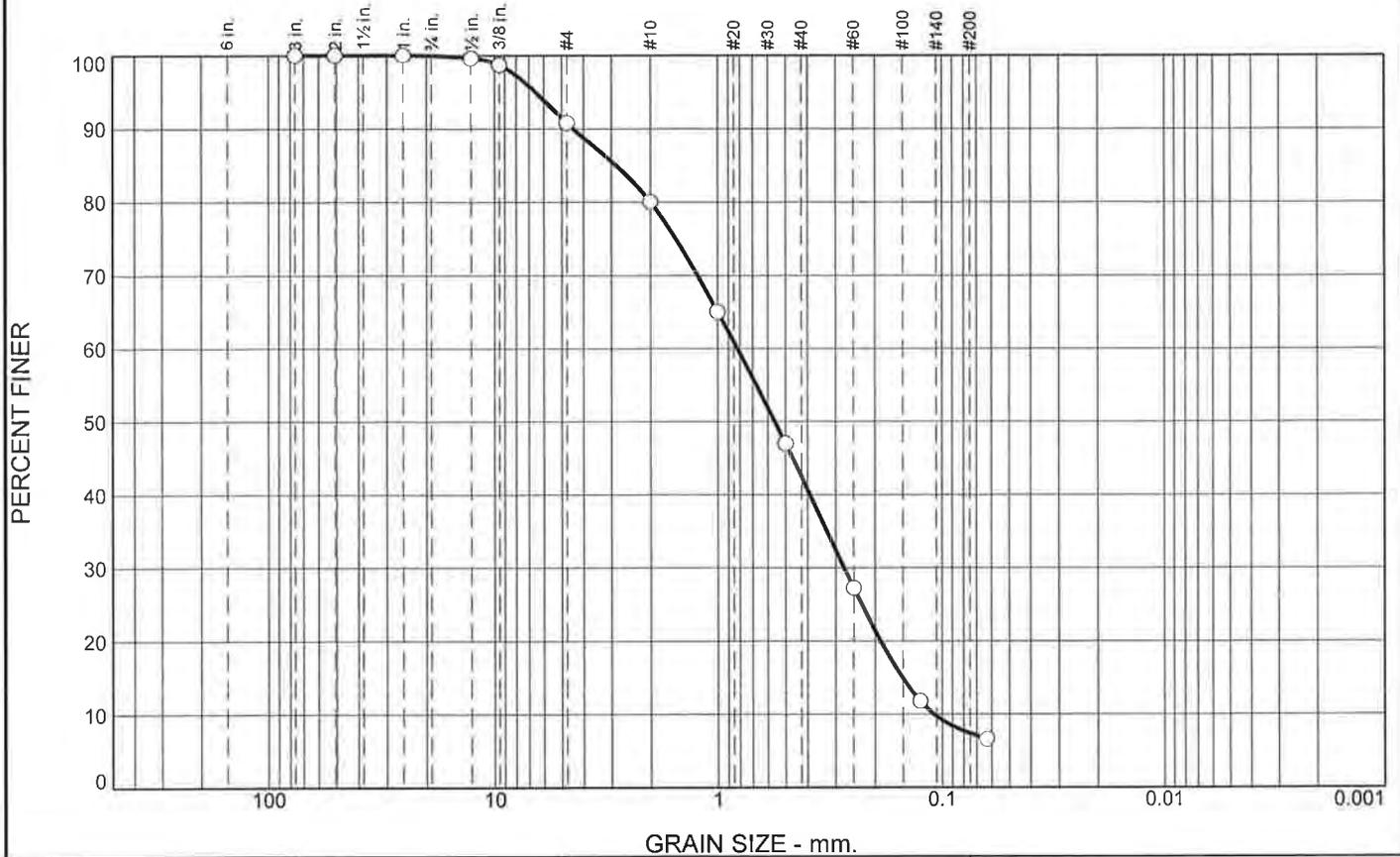
UT1C, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	18	21	39	39	39
SAND	Very fine	0.062	0.125	7	2	9	9	48
	Fine	0.125	0.250	1	1	2	2	50
	Medium	0.25	0.50	5		5	5	55
	Coarse	0.5	1.0	7	1	8	8	63
	Very Coarse	1.0	2.0	1	2	3	3	66
GRAVEL	Very Fine	2.0	2.8	2	1	3	3	69
	Very Fine	2.8	4.0	1		1	1	70
	Fine	4.0	5.6	5		5	5	75
	Fine	5.6	8.0	6		6	6	81
	Medium	8.0	11.0	6		6	6	87
	Medium	11.0	16.0	1		1	1	88
	Coarse	16.0	22.6	3		3	3	91
	Coarse	22.6	32	4	1	5	5	96
	Very Coarse	32	45	2		2	2	98
	Very Coarse	45	64		1	1	1	99
COBBLE	Small	64	90	1		1	1	100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
BEDROCK	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				70	30	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	Silt/Clay
D ₅₀ =	0.3
D ₈₄ =	9.4
D ₉₅ =	29.8
D ₁₀₀ =	90.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.1	9.1	10.8	37.6	35.0	7.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	100.0		
0.5	99.6		
0.375	98.7		
#4	90.8		
#10	80.0		
#18	65.0		
#35	47.0		
#60	27.3		
#120	11.7		
#230	6.7		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 4.4449 D₈₅= 2.8593 D₆₀= 0.8181

D₅₀= 0.5578 D₃₀= 0.2754 D₁₅= 0.1513

D₁₀= 0.1091 C_u= 7.50 C_c= 0.85

USCS= **Classification** AASHTO=

Remarks

Secondary Axis: 0.74", 0.82"

Total Weight: 1845.48g

Location: UTIC, XS-12, Riffle Grab 7/15, CM/SG

Date: 08-18-14

Summit Engineering

Ft. Mill, South Carolina

Client: Wildlands Engineering

Project: Candy Creek

Project No: SL-262-11

Figure

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UTIC, XS-12, Riffle Grab 7/15, CM/SG

Date: 08-18-14

Testing Remarks: Secondary Axis: 0.74", 0.82"

Total Weight: 1845.48g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1845.48	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	0.00	100.0
			0.5	7.31	99.6
			0.375	23.95	98.7
			#4	169.72	90.8
			#10	369.10	80.0
			#18	645.92	65.0
			#35	978.10	47.0
			#60	1341.66	27.3
			#120	1629.56	11.7
			#230	1721.83	6.7

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.1	9.1	9.2	10.8	37.6	35.0	83.4			7.4

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.1091	0.1513	0.1894	0.2754	0.5578	0.8181	2.0000	2.8593	4.4449	6.5620

Fineness Modulus	C _u	C _c
2.60	7.50	0.85

Reachwide and Cross Section Pebble Count Plots

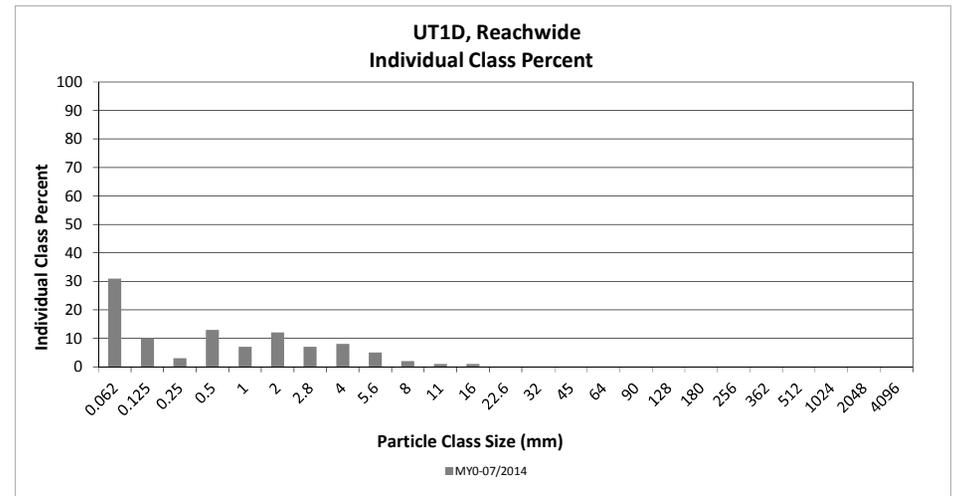
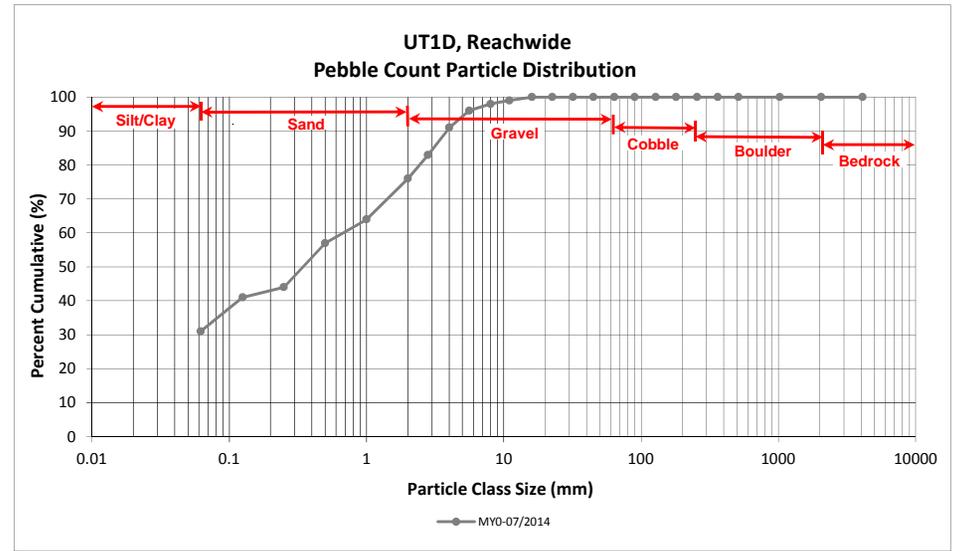
Candy Creek Mitigation Site

Existing Conditions - 2014

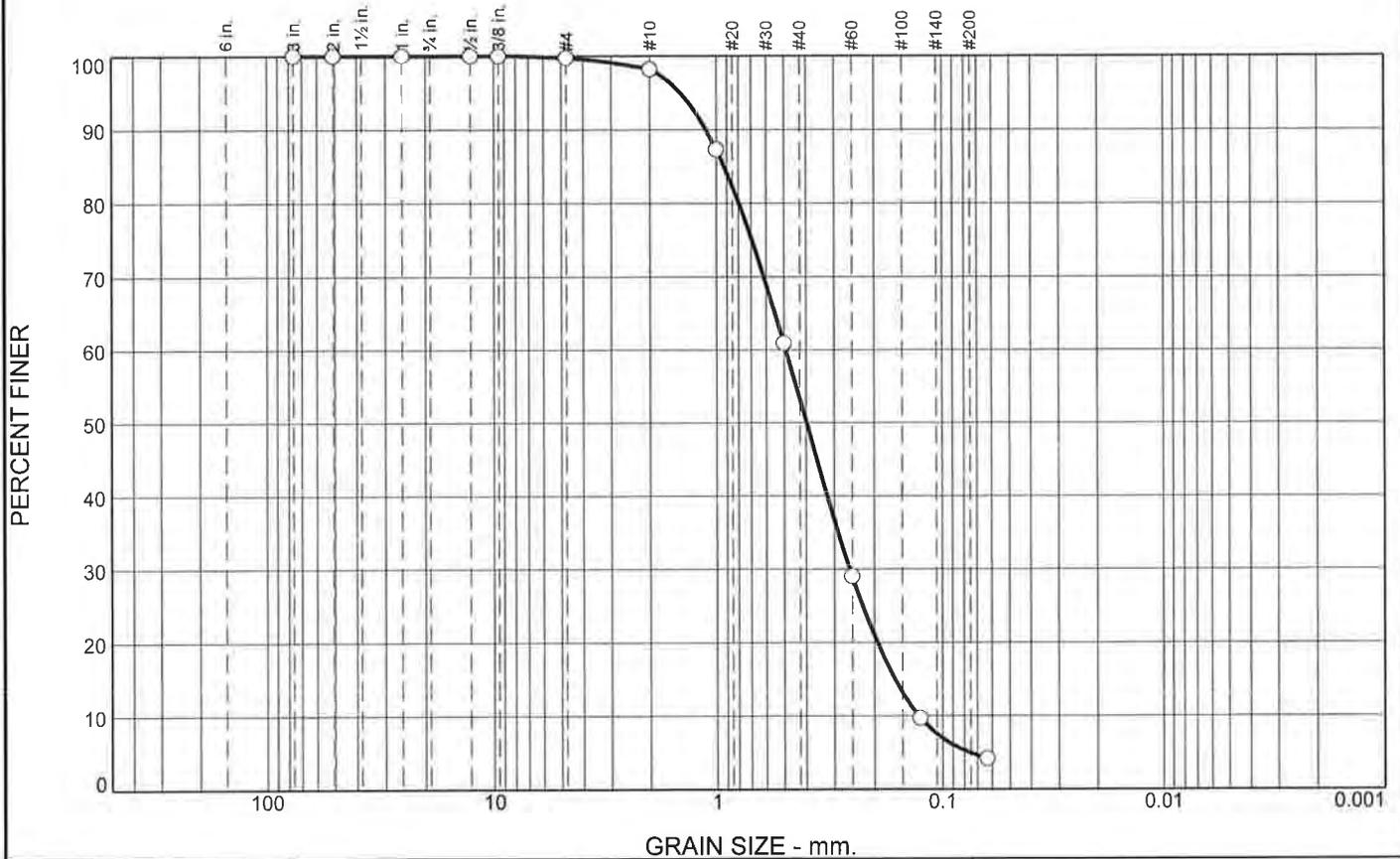
UT1D, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	17	14	31	31	31
SAND	Very fine	0.062	0.125	8	2	10	10	41
	Fine	0.125	0.250	1	2	3	3	44
	Medium	0.25	0.50	8	5	13	13	57
	Coarse	0.5	1.0	5	2	7	7	64
	Very Coarse	1.0	2.0	11	1	12	12	76
GRAVEL	Very Fine	2.0	2.8	6	1	7	7	83
	Very Fine	2.8	4.0	7	1	8	8	91
	Fine	4.0	5.6	4	1	5	5	96
	Fine	5.6	8.0	2		2	2	98
	Medium	8.0	11.0	1		1	1	99
	Medium	11.0	16.0		1	1	1	100
	Coarse	16.0	22.6					100
	Coarse	22.6	32					100
	Very Coarse	32	45					100
	Very Coarse	45	64					100
COBBLE	Small	64	90					100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				70	30	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.08
D ₅₀ =	0.3
D ₈₄ =	2.9
D ₉₅ =	5.2
D ₁₀₀ =	16.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.5	45.0	48.2	5.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	100.0		
0.5	100.0		
0.375	100.0		
#4	99.7		
#10	98.2		
#18	87.3		
#35	60.9		
#60	29.0		
#120	9.7		
#230	4.2		

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 1.1141 D₈₅= 0.9228 D₆₀= 0.4904

D₅₀= 0.3975 D₃₀= 0.2563 D₁₅= 0.1622

D₁₀= 0.1273 C_u= 3.85 C_c= 1.05

USCS= **Classification** AASHTO=

Remarks

Secondary Axis: 0.38", 0.35"

Total weight: 2172.74g

* (no specification provided)

Location: UT-1D, XS-13 Grab (Bar) Sample 7/14 CM,SG

Date: 08-18-14

<p>Summit Engineering</p> <p>Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p>
<p>Figure</p>	

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UT-1D, XS-13 Grab (Bar) Sample 7/14 CM,SG

Date: 08-18-14

Testing Remarks: Secondary Axis: 0.38", 0.35"

Total weight: 2172.74g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2172.74	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	0.00	100.0
			0.5	0.00	100.0
			0.375	0.00	100.0
			#4	5.88	99.7
			#10	39.11	98.2
			#18	275.94	87.3
			#35	849.54	60.9
			#60	1542.65	29.0
			#120	1961.98	9.7
			#230	2081.48	4.2

Fractional Components

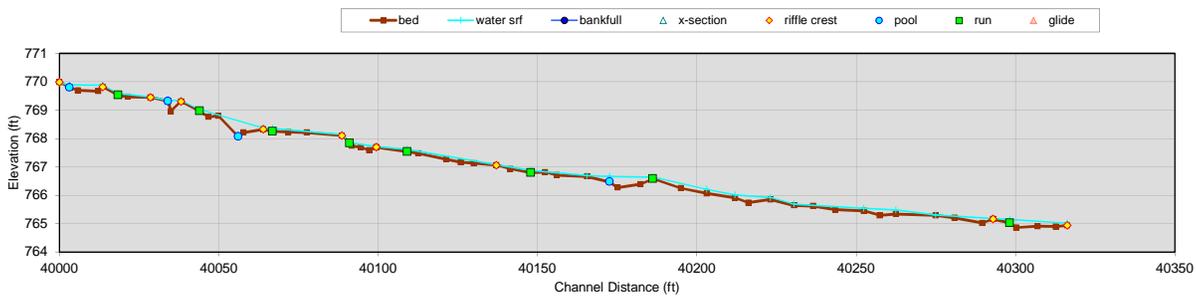
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	1.5	45.0	48.2	94.7			5.0

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.1273	0.1622	0.1939	0.2563	0.3975	0.4904	0.7925	0.9228	1.1141	1.4624

Fineness Modulus	C _u	C _c
1.91	3.85	1.05

Longitudinal Slope Profile

UT2 Reach 1

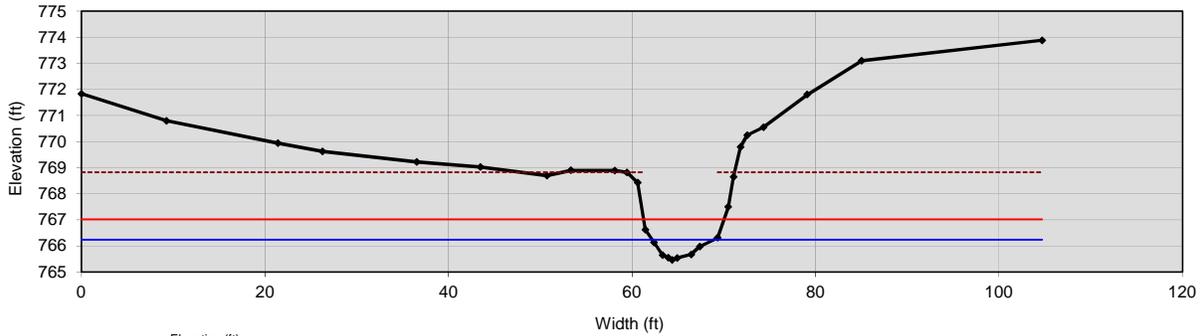


	slope (%)	slope ratio	length (ft)	length ratio	pool-pool spacing (ft)	p-p ratio
reach	1.6	---	40316.2 (8212.1 channel width)	---	---	---
riffle	3.5 (0.33 - 11)	2.2 (0.2 - 6.9)	5.6 (2.5 - 10.8)	1.1 (0.5 - 2.2)	---	---
pool	0 (0 - 0.21)	0 (0 - 0.1)	9.0 (4.1 - 13.7)	1.8 (0.8 - 2.8)	56.5 (22.1 - 111)	11.5 (4.5 - 23.7)
run	2 (0.71 - 7.4)	1.3 (0.4 - 4.6)	28.7 (8.3 - 106.7)	5.8 (1.7 - 21.7)	---	---
	---	---	---	---	---	---

notes	cross section ID	bed feature	BkF channel centerline				user defined					
			easting (ft)	northing (ft)	station	ELEV centerline	ELEV thalweg	ELEV water	ELEV bankfull	ELEV a	ELEV b	ELEV c
(TWG HOR)TWG HOR		R			40000.0		769.988	769.964				
(TWG TOR)TWG TOR		P			40003.2		769.799	769.886				
(TWG)TWG					40005.8		769.695					
(TWG)TWG					40012.2		769.671					
(TWG HOR)TWG HOR		R			40013.6		769.819	769.88				
(TWG TOR)TWG TOR		N			40018.5		769.525	769.593				
(TWG)TWG					40021.5		769.466					
(TWG HOR)TWG HOR		R			40028.6		769.453	769.463				
(TWG TOR)TWG TOR		P			40034.1		769.316	769.345				
(TWG MAX POOL)TWG MAX POOL					40034.9		768.955					
(TWG HOR)TWG HOR		R			40038.2		769.306	769.341				
(TWG TOR)TWG TOR		n			40044.0		768.96	769.013				
(TWG)TWG					40046.8		768.758					
(TWG)TWG					40049.9		768.798					
(TWG)TWG		P			40056.2		768.064					
(TWG)TWG					40057.8		768.21					
(TWG HOR)TWG HOR		R			40063.9		768.323	768.369				
(TWG TOR)TWG TOR		N			40066.9		768.252	768.359				
(TWG)TWG					40071.9		768.229					
(TWG)TWG					40077.6		768.213					
(TWG HOR)TWG HOR		R			40088.7		768.105	768.136				
(TWG TOR)TWG TOR		N			40091.2		767.834	767.853				
(TWG)TWG					40091.7		767.738					
(TWG)TWG					40094.7		767.687					
(TWG)TWG					40097.2		767.582					
(TWG HOR)TWG HOR		R			40099.4		767.697	767.716				
(TWG TOR)TWG TOR		N			40109.2		767.531	767.619				
(TWG)TWG					40112.6		767.474					
(TWG)TWG					40121.4		767.271					
(TWG)TWG					40125.9		767.169					
(TWG)TWG					40130.0		767.129					
(TWG HOR)TWG HOR		R			40137.1		767.062	767.075				
(TWG)TWG					40141.5		766.926					
(TWG TOR)TWG TOR		N			40147.9		766.793	766.875				
(TWG)TWG					40152.4		766.817					
(TWG)TWG					40156.0		766.706					
(TWG)TWG					40165.5		766.662	766.691				
(TWG)TWG		P			40172.6		766.473	766.662				
(TWG FENCE)TWG FENCE					40175.1		766.272					
(TWG)TWG					40182.4		766.39					
(TWG)TWG		n			40186.3		766.577	766.633				
(TWG)TWG					40195.1		766.247					
(TWG)TWG					40203.2		766.063	766.203				
(TWG)TWG					40212.0		765.911	766.012				
(TWG)TWG					40216.2		765.736					
(TWG)TWG					40223.1		765.848	765.915				
(TWG)TWG					40230.5		765.643	765.685				
(TWG)TWG					40236.5		765.619					
(TWG)TWG					40243.5		765.49					
(TWG)TWG					40252.3		765.452	765.538				
(TWG)TWG					40257.4		765.29					
(TWG)TWG					40262.4		765.342	765.477				
(TWG)TWG					40275.0		765.289	765.302				
(TWG)TWG					40280.8		765.206					
(TWG)TWG					40289.6		765.021					
(TWG HOR)TWG HOR		R			40292.9		765.158	765.181				
(TWG TOR)TWG TOR		n			40298.2		765.018	765.143				
(TWG)TWG					40300.3		764.858					
(TWG)TWG					40307.0		764.908					
(TWG)TWG					40312.7		764.899					
(TWG HOR)TWG HOR		R			40316.2		764.934	765.016				

Cross Section 15

UT2 US of Pond, riffle



Bankfull Dimensions

3.0	x-section area (ft.sq.)
6.7	width (ft)
0.4	mean depth (ft)
0.8	max depth (ft)
6.9	wetted parimeter (ft)
0.4	hyd radi (ft)
14.9	width-depth ratio

Flood Dimensions

8.7	W flood prone area (ft)
1.3	entrenchment ratio
3.4	low bank height (ft)
4.3	low bank height ratio

Materials

20	D50 Riffle (mm)
40	D84 Riffle (mm)
21	threshold grain size (mm):

Bankfull Flow

3.0	velocity (ft/s)
9.0	discharge rate (cfs)
0.80	Froude number

Flow Resistance

0.036	Manning's roughness
0.20	D'Arcy-Weisbach fric.
6.3	resistance factor u/u*
3.4	relative roughness

Forces & Power

1.6	channel slope (%)
0.43	shear stress (lb/sq.ft.)
0.47	shear velocity (ft/s)
1.34	unit strm power (lb/ft/s)

Cross Section

reference ID: 15
 longitudinal station: ---
 alignment: straight line
 feature: ---

Bankfull Stage

elevation: 766.2369

Low Bank Height

elevation: 768.822

Flood Prone Area

width fpa: 8.7

Channel Slope

percent slope: 1.6

Flow Resistance

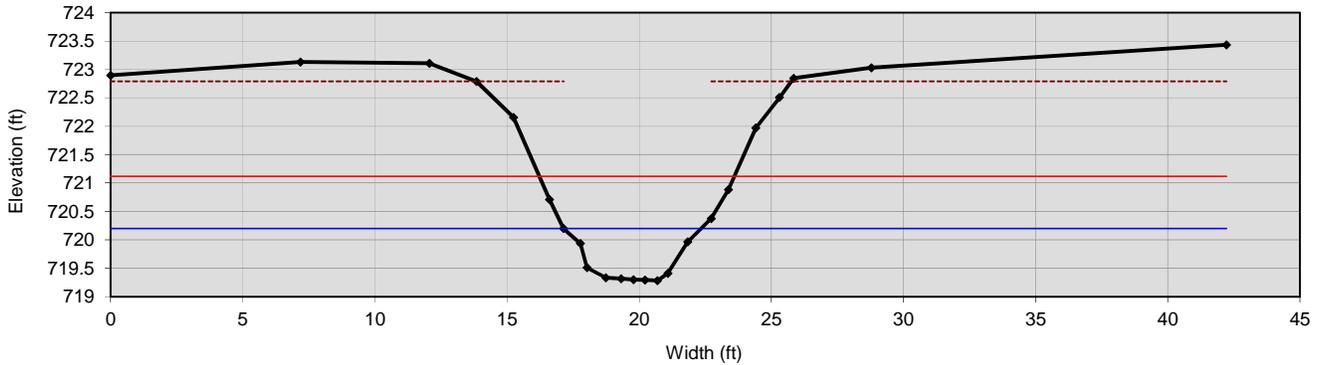
Manning's "n": 0.036
 D'Arcy - Weisbach "f": 0.20

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	771.826	<input type="checkbox"/>	(XS 15 RIFF)
		9.27	770.799	<input type="checkbox"/>	(XS 15)XS 1
		21.41	769.94	<input type="checkbox"/>	(XS 15)XS 1
		26.28	769.626	<input type="checkbox"/>	(XS 15)XS 1
		36.53	769.216	<input type="checkbox"/>	(XS 15)XS 1
		43.48	769.022	<input type="checkbox"/>	(XS 15)XS 1
		50.72	768.695	<input type="checkbox"/>	(XS 15)XS 1
		53.33	768.897	<input type="checkbox"/>	(XS 15)XS 1
		58.11	768.887	<input type="checkbox"/>	(XS 15)XS 1
		59.46	768.822	<input type="checkbox"/>	(XS 15 LTB)
		60.62	768.422	<input type="checkbox"/>	(XS 15)XS 1
		61.45	766.625	<input type="checkbox"/>	(XS 15)XS 1
		62.41	766.127	<input type="checkbox"/>	(XS 15)XS 1
		63.33	765.643	<input type="checkbox"/>	(XS 15 LCH)
		63.95	765.543	<input type="checkbox"/>	(XS 15)XS 1
		64.37	765.457	<input type="checkbox"/>	(XS 15 TWG)
		64.94	765.539	<input type="checkbox"/>	(XS 15 REW)
		66.45	765.666	<input type="checkbox"/>	(XS 15)XS 1
		67.39	765.977	<input type="checkbox"/>	(XS 15)XS 1
		69.33	766.311	<input type="checkbox"/>	(XS 15 RCH)
		70.48	767.494	<input type="checkbox"/>	(XS 15)XS 1
		71.06	768.645	<input type="checkbox"/>	(XS 15)XS 1
		71.82	769.793	<input type="checkbox"/>	(XS 15)XS 1
		72.55	770.249	<input type="checkbox"/>	(XS 15 RTB)
		74.33	770.547	<input type="checkbox"/>	(XS 15)XS 1
		79.10	771.801	<input type="checkbox"/>	(XS 15)XS 1
		85.03	773.103	<input type="checkbox"/>	(XS 15)XS 1
		104.70	773.884	<input type="checkbox"/>	(XS 15)XS 1
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Cross Section 14

UT2 Reach 2, riffle



Bankfull Dimensions

3.3	x-section area (ft.sq.)
5.2	width (ft)
0.6	mean depth (ft)
0.9	max depth (ft)
5.8	wetted parimeter (ft)
0.6	hyd radi (ft)
8.3	width-depth ratio

Flood Dimensions

7.4	W flood prone area (ft)
1.4	entrenchment ratio
3.5	low bank height (ft)
3.8	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
35	threshold grain size (mm):

Bankfull Flow

3.6	velocity (ft/s)
12.0	discharge rate (cfs)
0.85	Froude number

Flow Resistance

0.040	Manning's roughness
---	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

2.02	channel slope (%)
0.72	shear stress (lb/sq.ft.)
0.61	shear velocity (ft/s)
2.9	unit strm power (lb/ft/s)

Cross Section

reference ID	14
longitudinal station	---
alignment	straight line
feature	

Bankfull Stage

elevation	720.2
-----------	-------

Low Bank Height

elevation	722.79
-----------	--------

Flood Prone Area

width fpa	7.4
-----------	-----

Channel Slope

percent slope	---
---------------	-----

Flow Resistance

Manning's "n"	---
D'Arcy - Weisbach "f"	---

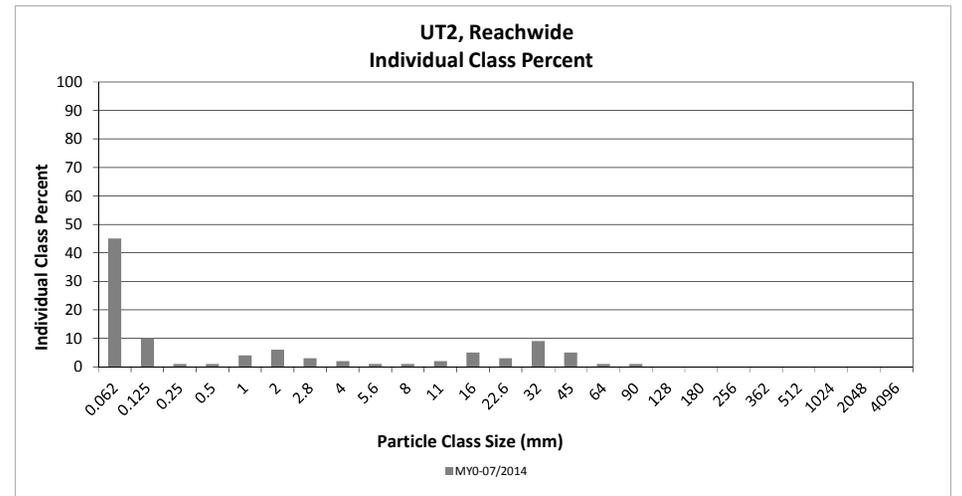
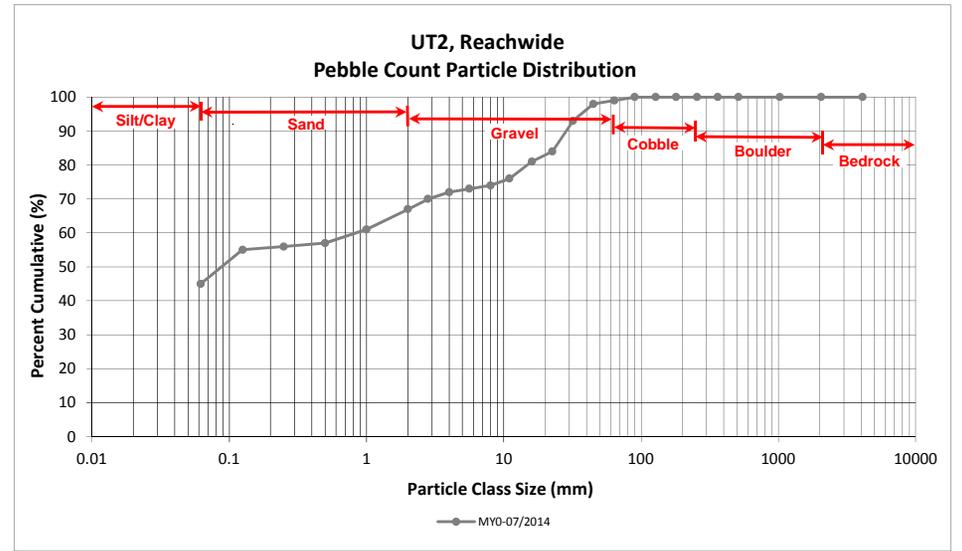
Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	722.893	<input type="checkbox"/>	(XS 14 RIFF)
			723.127	<input type="checkbox"/>	(XS 14)XS 14
			723.107	<input type="checkbox"/>	(XS 14)XS 14
			722.788	<input type="checkbox"/>	(XS 14 LTB)
			722.154	<input type="checkbox"/>	(XS 14)XS 14
			720.709	<input type="checkbox"/>	(XS 14)XS 14
			720.201	<input type="checkbox"/>	(XS 14)XS 14
			719.937	<input type="checkbox"/>	(XS 14)XS 14
			719.509	<input type="checkbox"/>	(XS 14 LCH)
			719.332	<input type="checkbox"/>	(XS 14)XS 14
			719.315	<input type="checkbox"/>	(XS 14 LEW)
			719.301	<input type="checkbox"/>	(XS 14)XS 14
			719.292	<input type="checkbox"/>	(XS 14 TWG)
			719.282	<input type="checkbox"/>	(XS 14 REW)
			719.41	<input type="checkbox"/>	(XS 14 RCH)
			719.963	<input type="checkbox"/>	(XS 14)XS 14
			720.373	<input type="checkbox"/>	(XS 14)XS 14
			720.881	<input type="checkbox"/>	(XS 14)XS 14
			721.969	<input type="checkbox"/>	(XS 14)XS 14
			722.509	<input type="checkbox"/>	(XS 14)XS 14
			722.845	<input type="checkbox"/>	(XS 14 RTB)
			723.027	<input type="checkbox"/>	(XS 14)XS 14
			723.433	<input type="checkbox"/>	(XS 14)XS 14
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Reachwide and Cross Section Pebble Count Plots
 Candy Creek Mitigation Site
 Existing Conditions - 2014
 UT2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	28	17	45	45	45
SAND	Very fine	0.062	0.125	4	6	10	10	55
	Fine	0.125	0.250	1		1	1	56
	Medium	0.25	0.50		1	1	1	57
	Coarse	0.5	1.0	3	1	4	4	61
	Very Coarse	1.0	2.0	2	4	6	6	67
GRAVEL	Very Fine	2.0	2.8	3		3	3	70
	Very Fine	2.8	4.0	2		2	2	72
	Fine	4.0	5.6	1		1	1	73
	Fine	5.6	8.0	1		1	1	74
	Medium	8.0	11.0	2		2	2	76
	Medium	11.0	16.0	4	1	5	5	81
	Coarse	16.0	22.6	3		3	3	84
	Coarse	22.6	32	9		9	9	93
	Very Coarse	32	45	5		5	5	98
	Very Coarse	45	64	1		1	1	99
COBBLE	Small	64	90	1		1	1	100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				70	30	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	Silt/Clay
D ₅₀ =	0.1
D ₈₄ =	22.6
D ₉₅ =	36.7
D ₁₀₀ =	90.0



Reachwide and Cross Section Pebble Count Plots

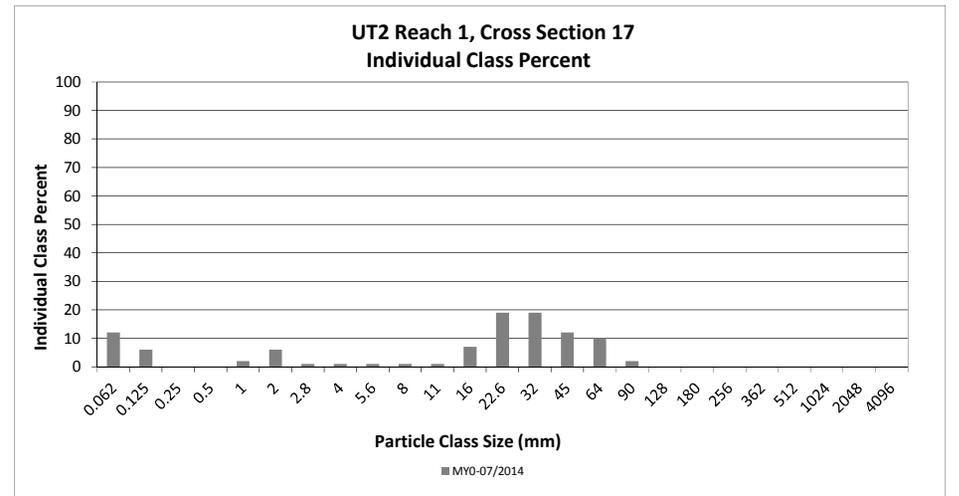
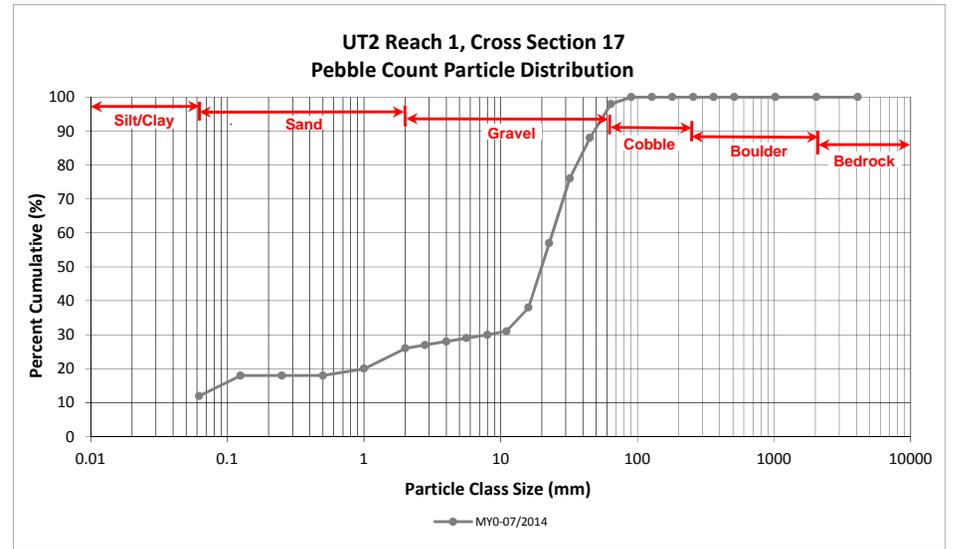
Candy Creek Mitigation Site

Existing Conditions - 2014

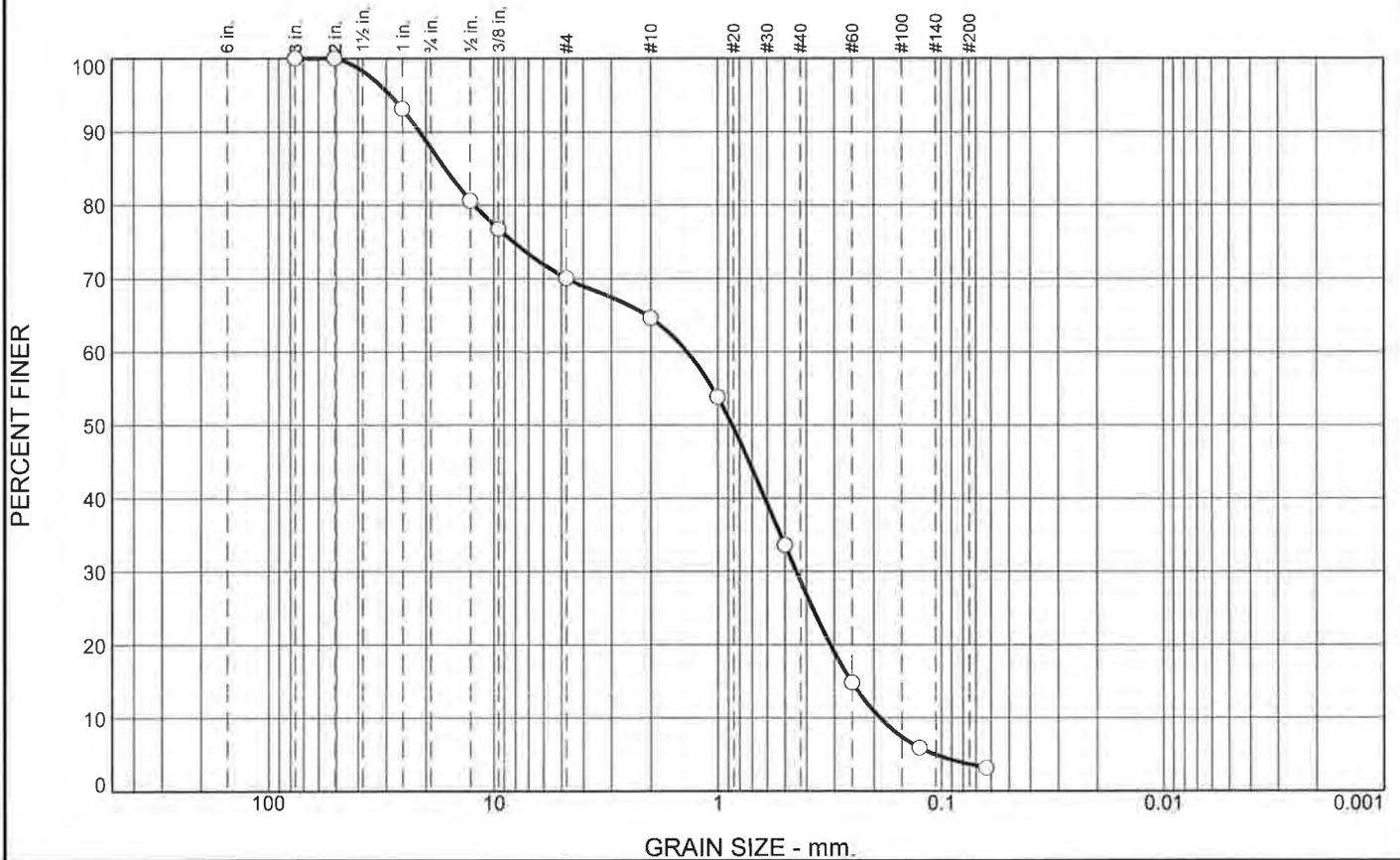
UT2 Reach 1, Cross Section 17

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	12	12	12
SAND	Very fine	0.062	0.125	6	6	18
	Fine	0.125	0.250			18
	Medium	0.25	0.50			18
	Coarse	0.5	1.0	2	2	20
	Very Coarse	1.0	2.0	6	6	26
GRAVEL	Very Fine	2.0	2.8	1	1	27
	Very Fine	2.8	4.0	1	1	28
	Fine	4.0	5.6	1	1	29
	Fine	5.6	8.0	1	1	30
	Medium	8.0	11.0	1	1	31
	Medium	11.0	16.0	7	7	38
	Coarse	16.0	22.6	19	19	57
	Coarse	22.6	32	19	19	76
	Very Coarse	32	45	12	12	88
	Very Coarse	45	64	10	10	98
	COBBLE	Small	64	90	2	2
Small		90	128			100
Large		128	180			100
Large		180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
Total				100	100	100

Cross Section 17	
Channel materials (mm)	
D ₁₆ =	0.10
D ₃₅ =	13.63
D ₅₀ =	19.9
D ₈₄ =	40.2
D ₉₅ =	57.6
D ₁₀₀ =	90.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.1	17.9	5.4	36.0	24.9	3.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	93.0		
0.5	80.6		
0.375	76.7		
#4	70.0		
#10	64.6		
#18	53.8		
#35	33.6		
#60	14.8		
#120	5.9		
#230	3.2		

Material Description

PL= **Atterberg Limits** PI=

LL= PI=

Coefficients

D₉₀= 21.3542 D₈₅= 16.3880 D₆₀= 1.3746

D₅₀= 0.8605 D₃₀= 0.4450 D₁₅= 0.2524

D₁₀= 0.1884 C_u= 7.30 C_c= 0.76

Classification

USCS= SP AASHTO=

Remarks

Secondary Axis: 2.73", 1.88"

Total Weight: 2400.99g

* (no specification provided)

Location: UT-2, XS-17, Subpave 7/14 CM, SG

Date: 08-18-14

<p style="text-align: center; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
---	--

Tested By: Mimi hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UT-2, XS-17, Subpave 7/14 CM, SG

Date: 08-18-14

USCS Classification: SP

Testing Remarks: Secondary Axis: 2.73", 1.88"

Total Weight: 2400.99g

Tested by: Mimi hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2400.99	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	166.87	93.0
			0.5	466.29	80.6
			0.375	558.43	76.7
			#4	719.54	70.0
			#10	850.00	64.6
			#18	1109.26	53.8
			#35	1594.26	33.6
			#60	2045.64	14.8
			#120	2259.33	5.9
			#230	2324.16	3.2

Fractional Components

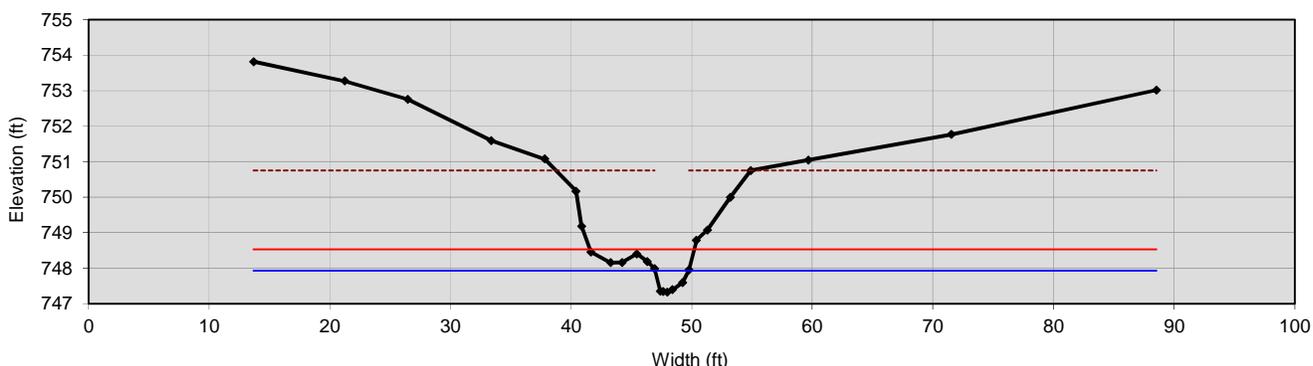
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	12.1	17.9	30.0	5.4	36.0	24.9	66.3			3.7

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.1884	0.2524	0.3129	0.4450	0.8605	1.3746	12.2214	16.3880	21.3542	28.8449

Fineness Modulus	C _u	C _c
3.78	7.30	0.76

Cross Section 18

UT2a-XS18, riffle



Bankfull Dimensions	
1.2	x-section area (ft.sq.)
2.8	width (ft)
0.4	mean depth (ft)
0.6	max depth (ft)
3.2	wetted parimeter (ft)
0.4	hyd radi (ft)
6.6	width-depth ratio

Flood Dimensions	
8.6	W flood prone area (ft)
3.1	entrenchment ratio
3.4	low bank height (ft)
5.7	low bank height ratio

Materials	
---	D50 (mm)
---	D84 (mm)
37	threshold grain size (mm):

Bankfull Flow	
3.5	velocity (ft/s)
4.0	discharge rate (cfs)
1.01	Froude number

Flow Resistance	
0.040	Manning's roughness
---	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power	
3.3	channel slope (%)
0.75	shear stress (lb/sq.ft.)
0.62	shear velocity (ft/s)
3	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

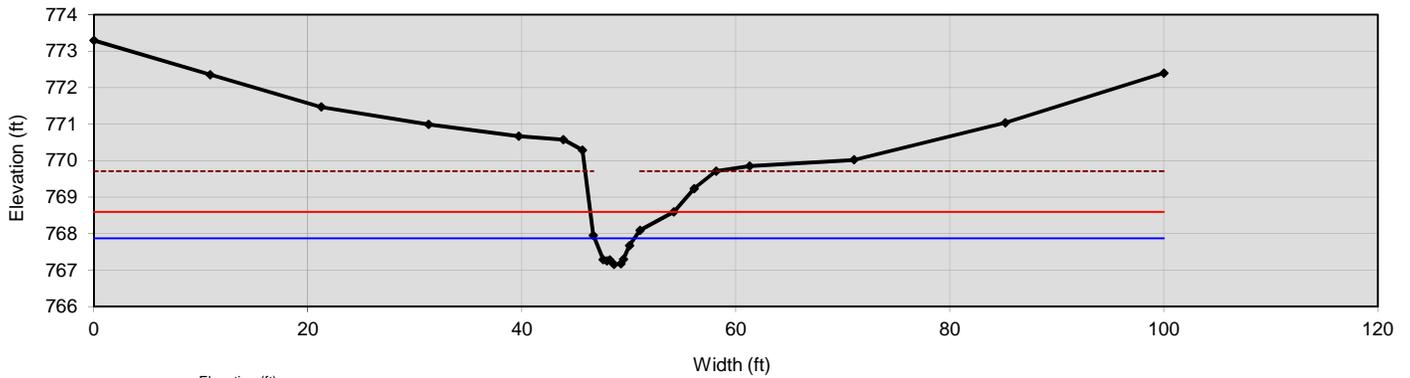
D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		13.69	753.815	<input type="checkbox"/>	(XS 18 RIFF)
		21.25	753.271	<input type="checkbox"/>	(XS 18)XS 18
		26.48	752.759	<input type="checkbox"/>	(XS 18)XS 18
		33.40	751.593	<input type="checkbox"/>	(XS 18)XS 18
		37.82	751.075	<input type="checkbox"/>	(XS 18)XS 18
		40.42	750.164	<input type="checkbox"/>	(XS 18 LTB)
		40.88	749.176	<input type="checkbox"/>	(XS 18)XS 18
		41.64	748.455	<input type="checkbox"/>	(XS 18)XS 18
		43.29	748.154	<input type="checkbox"/>	(XS 18)XS 18
		44.24	748.158	<input type="checkbox"/>	(XS 18)XS 18
		45.46	748.402	<input type="checkbox"/>	(XS 18)XS 18
		46.32	748.186	<input type="checkbox"/>	(XS 18)XS 18
		46.92	747.99	<input type="checkbox"/>	(XS 18)XS 18
		47.40	747.35	<input type="checkbox"/>	(XS 18 LCH)
		47.64	747.339	<input type="checkbox"/>	(XS 18 WAT)
		47.98	747.329	<input type="checkbox"/>	(XS 18 TWG)
		48.42	747.394	<input type="checkbox"/>	(XS 18 WAT)
		49.25	747.594	<input type="checkbox"/>	(XS 18 RCH)
		49.78	747.955	<input type="checkbox"/>	(XS 18)XS 18
		50.40	748.786	<input type="checkbox"/>	(XS 18 BKF)
		51.31	749.071	<input type="checkbox"/>	(XS 18)XS 18
		53.20	749.995	<input type="checkbox"/>	(XS 18)XS 18
		54.90	750.75	<input type="checkbox"/>	(XS 18 RTB)
		59.69	751.047	<input type="checkbox"/>	(XS 18)XS 18
		71.54	751.766	<input type="checkbox"/>	(XS 18)XS 18
		88.52	753.018	<input type="checkbox"/>	(XS 18)XS 18
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Cross Section 25

UT2b, riffle



Bankfull Dimensions	
1.7	x-section area (ft.sq.)
3.7	width (ft)
0.5	mean depth (ft)
0.7	max depth (ft)
4.1	wetted parimeter (ft)
0.4	hyd radi (ft)
8.0	width-depth ratio

Flood Dimensions	
7.8	W flood prone area (ft)
2.1	entrenchment ratio
2.6	low bank height (ft)
3.6	low bank height ratio

Materials	
---	D50 (mm)
---	D84 (mm)
36	threshold grain size (mm):

Bankfull Flow	
3.5	velocity (ft/s)
6.1	discharge rate (cfs)
0.95	Froude number

Flow Resistance	
0.040	Manning's roughness
---	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power	
2.81	channel slope (%)
0.74	shear stress (lb/sq.ft.)
0.62	shear velocity (ft/s)
2.9	unit strm power (lb/ft/s)

Cross Section

reference ID: 25
 longitudinal station: ---
 alignment: straight line
 feature: [dropdown]

Bankfull Stage

elevation: 767.87 ---

Low Bank Height

elevation: 769.711

Flood Prone Area

width fpa: 7.8

Channel Slope

percent slope: ---

Flow Resistance

Manning's "n": ---
 D'Arcy - Weisbach "f": ---

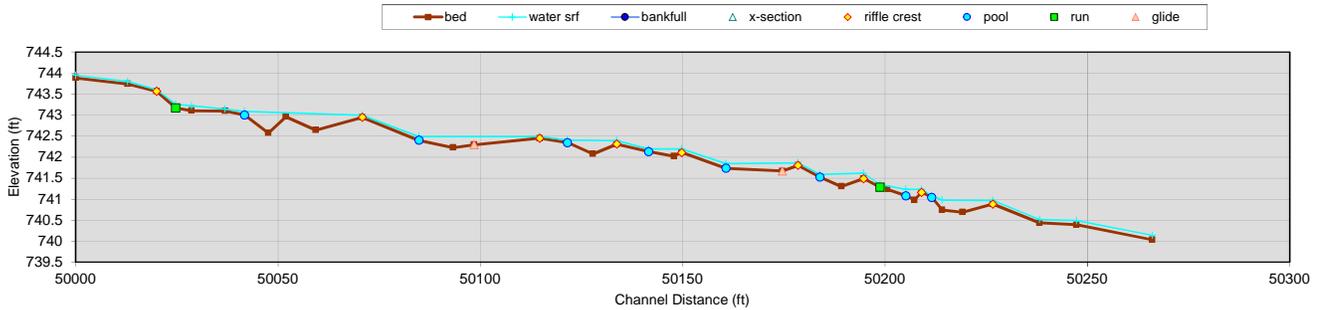
Note:

[Empty text box for notes]

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes	767.87	slope
		0.00	773.295	<input type="checkbox"/>	(XS 25 RIFF)	773.295	0.00
		10.87	772.355	<input type="checkbox"/>	(XS 25)XS 2	772.355	0.00
		21.25	771.471	<input type="checkbox"/>	(XS 25)XS 2	771.471	0.00
		31.28	770.992	<input type="checkbox"/>	(XS 25)XS 2	770.992	0.00
		39.70	770.669	<input type="checkbox"/>	(XS 25)XS 2	770.669	0.00
		43.89	770.576	<input type="checkbox"/>	(XS 25)XS 2	770.576	0.00
		45.66	770.288	<input type="checkbox"/>	(XS 25 LTB)	770.288	0.00
		46.68	767.951	<input type="checkbox"/>	(XS 25 LCH)	767.951	0.00
		47.60	767.281	<input type="checkbox"/>	(XS 25)XS 2	767.281	0.00
		47.95	767.254	<input type="checkbox"/>	(XS 25)XS 2	767.254	0.00
		48.22	767.276	<input type="checkbox"/>	(XS 25 LEW)	767.276	0.00
		48.61	767.15	<input type="checkbox"/>	(XS 25 TWG)	767.15	0.00
		49.26	767.176	<input type="checkbox"/>	(XS 25 REW)	767.176	0.00
		49.49	767.296	<input type="checkbox"/>	(XS 25 RCH)	767.296	0.00
		50.06	767.67	<input type="checkbox"/>	(XS 25)XS 2	767.67	0.00
		51.05	768.09	<input type="checkbox"/>	(XS 25)XS 2	768.09	0.00
		54.20	768.59	<input type="checkbox"/>	(XS 25)XS 2	768.59	0.00
		56.10	769.232	<input type="checkbox"/>	(XS 25)XS 2	769.232	0.00
		58.16	769.711	<input type="checkbox"/>	(XS 25 RTB)	769.711	0.00
		61.29	769.851	<input type="checkbox"/>	(XS 25)XS 2	769.851	0.00
		71.06	770.022	<input type="checkbox"/>	(XS 25)XS 2	770.022	0.00
		85.19	771.037	<input type="checkbox"/>	(XS 25)XS 2	771.037	0.00
		100.00	772.399	<input type="checkbox"/>	(XS 25)XS 2	772.399	0.00
				<input type="checkbox"/>		767.87	0.00
				<input type="checkbox"/>		767.87	0.00
				<input type="checkbox"/>		767.87	0.00
				<input type="checkbox"/>		767.87	0.00

Longitudinal Slope Profile

UT3



	slope (%)	slope ratio	length (ft)	length ratio	pool-pool spacing (ft)	p-p ratio
reach	1.4	---	50266.1 (8614.8 channel width)	---	---	---
riffle	4.4 (1.1 - 7.2)	3.1 (0.8 - 5.1)	7.1 (2.6 - 14)	1.2 (0.4 - 2.4)	---	---
pool	0.29 (0 - 0.78)	0.2 (0 - 0.6)	13.3 (3.8 - 29.1)	2.3 (0.7 - 5)	24.3 (6.4 - 43.1)	4.2 (1.1 - 7.4)
run	1.4 (0.99 - 1.8)	1 (0.7 - 1.3)	11.7 (6.4 - 17)	2 (1.1 - 2.9)	---	---
glide	---	---	10.1 (3.9 - 16.2)	1.7 (0.7 - 2.8)	---	---

notes	cross section ID	bed feature	BkF channel centerline				ELEV			user defined		
			easting (ft)	northing (ft)	station	centerline	thalweg	water	bankfull	a	b	c
(TWG)TWG					50000.0		743.884	743.945				
(TWG)TWG					50012.9		743.74	743.798				
(TWG)TWG		r			50020.0		743.565	743.601				
(TWG)TWG		n			50024.8		743.168	743.256				
(TWG)TWG					50028.7		743.102	743.222				
(TWG)TWG					50036.9		743.096	743.143				
(TWG)TWG		p			50041.7		743.003	743.089				
(TWG)TWG					50047.7		742.576					
(TWG)TWG					50052.0		742.958					
(TWG)TWG					50059.4		742.642					
(TWG)TWG		r			50070.8		742.944	742.999				
(TWG)TWG		p			50084.8		742.4	742.491				
(TWG)TWG					50093.3		742.226					
(TWG)TWG		g			50098.5		742.294					
(TWG)TWG		r			50114.7		742.45	742.486				
(TWG)TWG		p			50121.5		742.342	742.409				
(TWG)TWG					50127.8		742.075					
(TWG)TWG		r			50133.7		742.308	742.39				
(TWG)TWG		p			50141.6		742.13	742.192				
(TWG)TWG					50147.9		742.02					
(TWG)TWG		r			50149.8		742.109	742.194				
(TWG)TWG		p			50160.7		741.734	741.849				
(TWG)TWG		g			50174.6		741.668					
(TWG)TWG		r			50178.5		741.8	741.864				
(TWG)TWG		p			50184.0		741.52	741.591				
(TWG)TWG					50189.2		741.302					
(TWG)TWG		r			50194.7		741.488	741.615				
(TWG)TWG		n			50198.8		741.281	741.347				
(TWG)TWG					50200.6		741.232					
(TWG)TWG		p			50205.2		741.079	741.234				
(TWG)TWG					50207.3		740.977					
(TWG)TWG		r			50209.0		741.16	741.229				
(TWG)TWG		p			50211.6		741.04	741.083				
(TWG)TWG					50214.2		740.74	740.976				
(TWG)TWG					50219.2		740.689					
(TWG)TWG		r			50226.7		740.882	740.969				
(TWG)TWG					50238.2		740.435	740.514				
(TWG)TWG					50247.3		740.388	740.488				
(TWG)TWG					50266.1		740.031	740.136				
					0.0							

Reachwide and Cross Section Pebble Count Plots

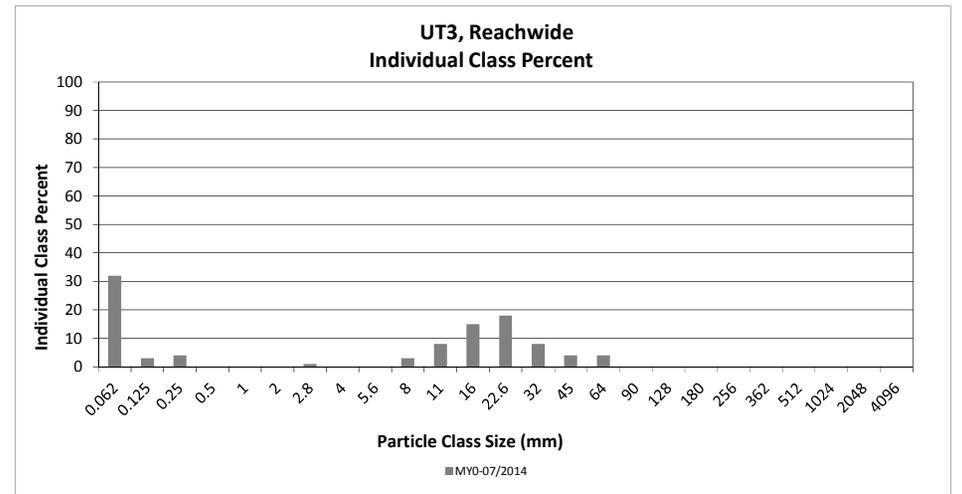
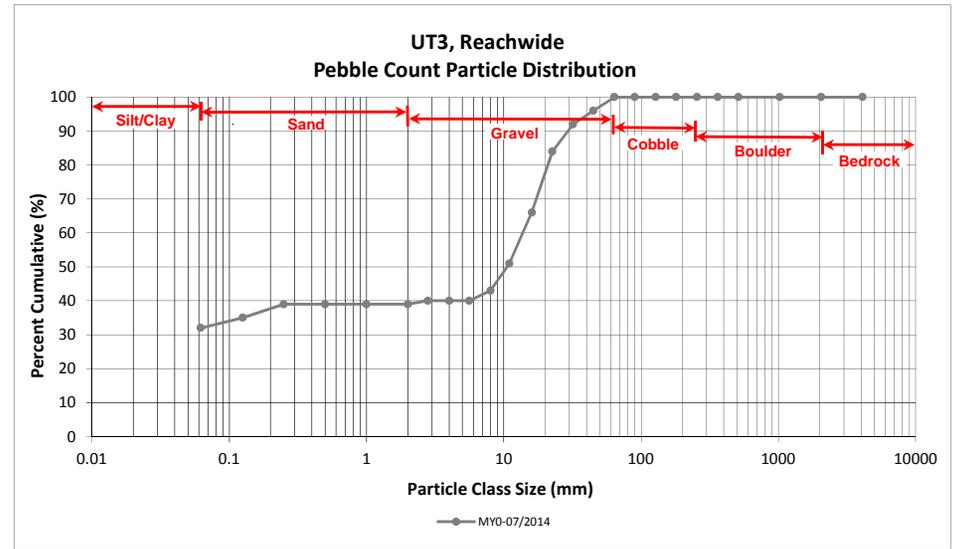
Candy Creek Mitigation Site

Existing Conditions - 2014

UT3, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	10	22	32	32	32
SAND	Very fine	0.062	0.125	1	2	3	3	35
	Fine	0.125	0.250	3	1	4	4	39
	Medium	0.25	0.50					39
	Coarse	0.5	1.0					39
	Very Coarse	1.0	2.0					39
GRAVEL	Very Fine	2.0	2.8	1		1	1	40
	Very Fine	2.8	4.0					40
	Fine	4.0	5.6					40
	Fine	5.6	8.0	2	1	3	3	43
	Medium	8.0	11.0	8		8	8	51
	Medium	11.0	16.0	15		15	15	66
	Coarse	16.0	22.6	14	4	18	18	84
	Coarse	22.6	32	8		8	8	92
	Very Coarse	32	45	4		4	4	96
	Very Coarse	45	64	4		4	4	100
COBBLE	Small	64	90					100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				70	30	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	0.13
D ₅₀ =	10.6
D ₈₄ =	22.6
D ₉₅ =	41.3
D ₁₀₀ =	64.0



Reachwide and Cross Section Pebble Count Plots

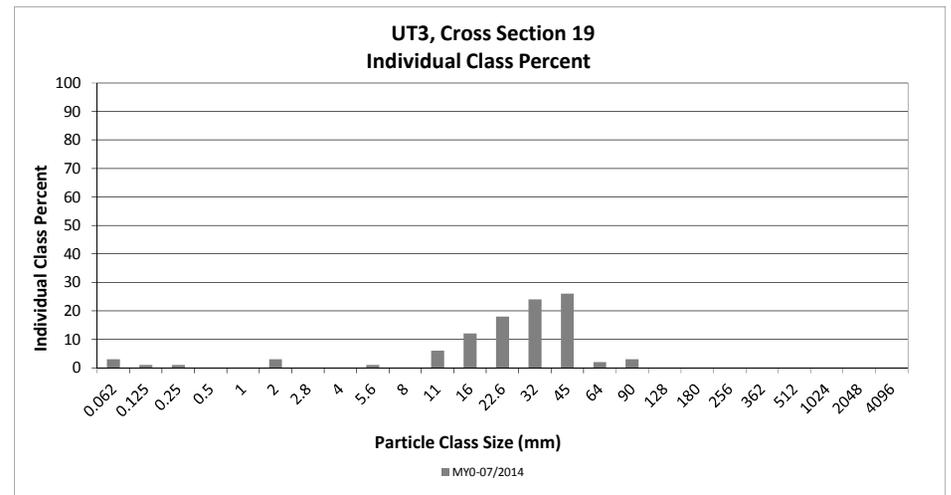
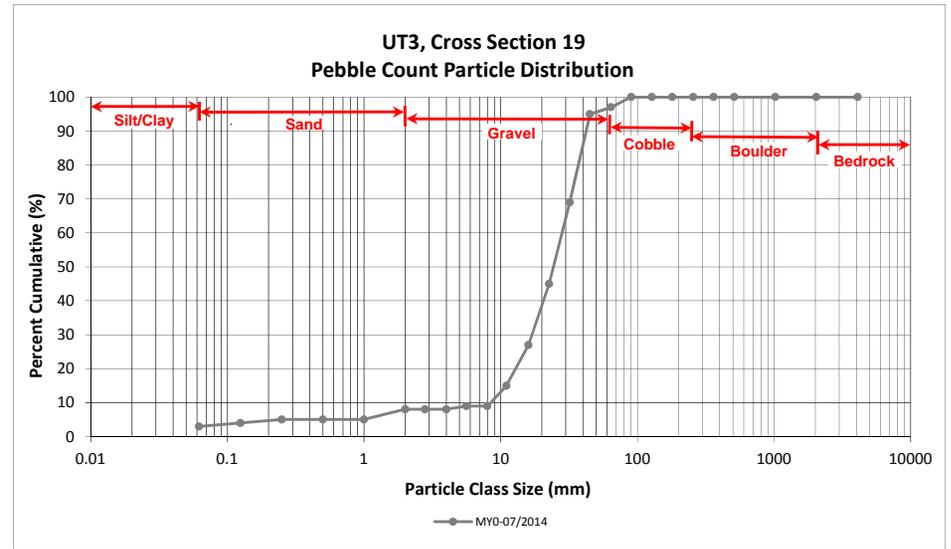
Candy Creek Mitigation Site

Existing Conditions - 2014

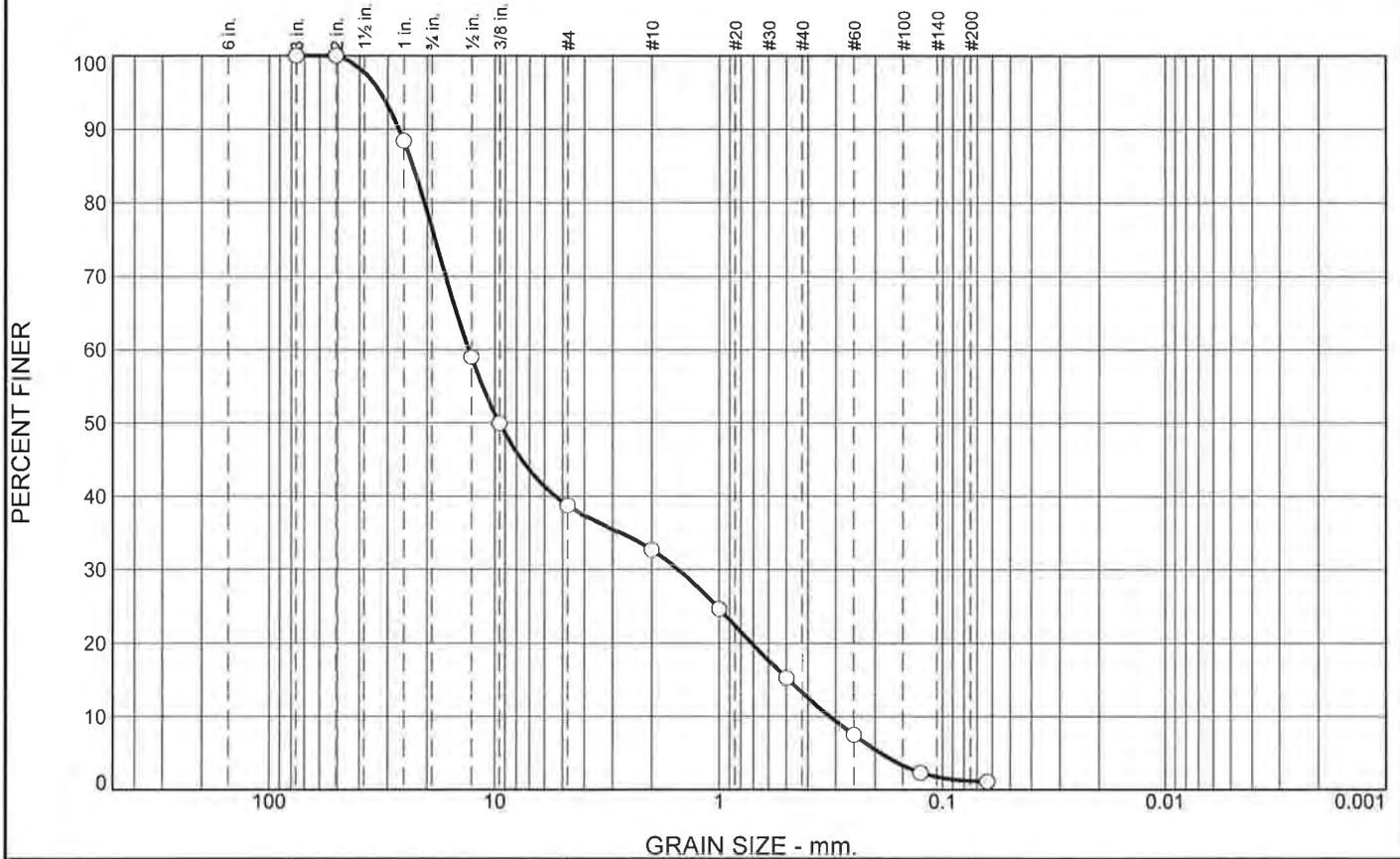
UT3, Cross Section 19

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	3	3	3
SAND	Very fine	0.062	0.125	1	1	4
	Fine	0.125	0.250	1	1	5
	Medium	0.25	0.50			5
	Coarse	0.5	1.0			5
	Very Coarse	1.0	2.0	3	3	8
GRAVEL	Very Fine	2.0	2.8			8
	Very Fine	2.8	4.0			8
	Fine	4.0	5.6	1	1	9
	Fine	5.6	8.0			9
	Medium	8.0	11.0	6	6	15
	Medium	11.0	16.0	12	12	27
	Coarse	16.0	22.6	18	18	45
	Coarse	22.6	32	24	24	69
	Very Coarse	32	45	26	26	95
	Very Coarse	45	64	2	2	97
COBBLE	Small	64	90	3	3	100
	Small	90	128			100
	Large	128	180			100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
Total				100	100	100

Cross Section 19	
Channel materials (mm)	
D ₁₆ =	11.35
D ₃₅ =	18.65
D ₅₀ =	24.3
D ₈₄ =	39.0
D ₉₅ =	45.0
D ₁₀₀ =	90.0



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	23.4	37.9	6.1	19.4	12.0	1.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	88.4		
0.5	58.9		
0.375	49.9		
#4	38.7		
#10	32.6		
#18	24.6		
#35	15.2		
#60	7.5		
#120	2.3		
#230	1.1		

Material Description

PL= **Atterberg Limits** PI=

LL= PI=

Coefficients

D₉₀= 26.7048 D₈₅= 23.1728 D₆₀= 13.0575

D₅₀= 9.5485 D₃₀= 1.5387 D₁₅= 0.4922

D₁₀= 0.3198 C_u= 40.83 C_c= 0.57

Classification

USCS= GP AASHTO=

Remarks

Secondary Axis: 2.60", 2.56"

Total Weight: 3249.23g

* (no specification provided)

Location: UT-3, XS-19, Subpave, 7/11 CM,SG

Date: 08-18-14

<p style="text-align: center; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
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Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/19/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UT-3, XS-19, Subpave, 7/11 CM,SG

Date: 08-18-14

USCS Classification: GP

Testing Remarks: Secondary Axis: 2.60", 2.56"

Total Weight: 3249.23g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
3249.23	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	377.94	88.4
			0.5	1334.41	58.9
			0.375	1626.66	49.9
			#4	1991.38	38.7
			#10	2189.98	32.6
			#18	2449.92	24.6
			#35	2755.35	15.2
			#60	3005.54	7.5
			#120	3174.50	2.3
			#230	3213.49	1.1

Fractional Components

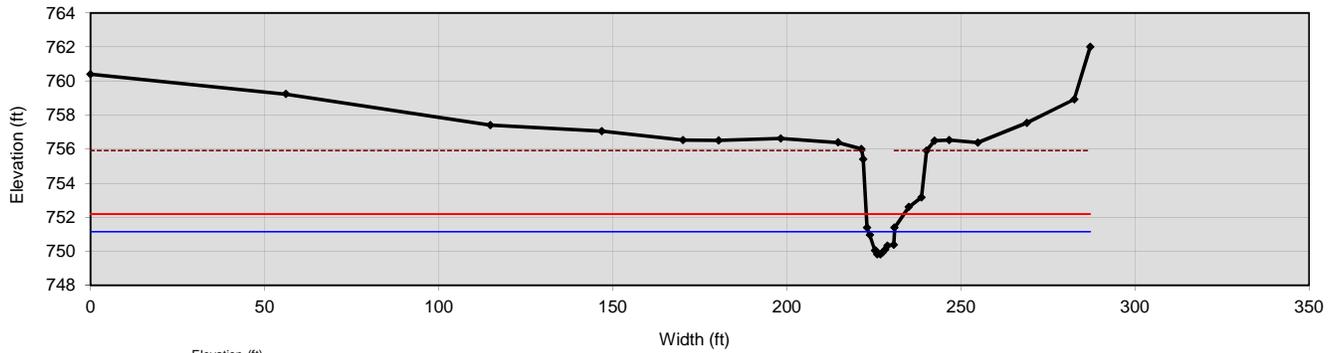
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	23.4	37.9	61.3	6.1	19.4	12.0	37.5			1.2

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.3198	0.4922	0.7159	1.5387	9.5485	13.0575	20.5430	23.1728	26.7048	32.4621

Fineness Modulus	C _u	C _c
5.46	40.83	0.57

Cross Section 21

UT4, pool



Bankfull Dimensions

6.8	x-section area (ft.sq.)
7.4	width (ft)
0.9	mean depth (ft)
1.3	max depth (ft)
8.5	wetted perimeter (ft)
0.8	hyd radi (ft)
8.2	width-depth ratio

Flood Dimensions

10.8	W flood prone area (ft)
1.5	entrenchment ratio
6.1	low bank height (ft)
4.6	low bank height ratio

Materials

15	D50 Riffle (mm)
22	D84 Riffle (mm)
21	threshold grain size (mm):

Bankfull Flow

4.4	velocity (ft/s)
29.7	discharge rate (cfs)
0.87	Froude number

Flow Resistance

0.027	Manning's roughness
0.09	D'Arcy-Weisbach fric.
9.3	resistance factor u/u*
12.6	relative roughness

Forces & Power

0.87	channel slope (%)
0.43	shear stress (lb/sq.ft.)
0.47	shear velocity (ft/s)
2.2	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

D'Arcy - Weisbach "f"

Note:

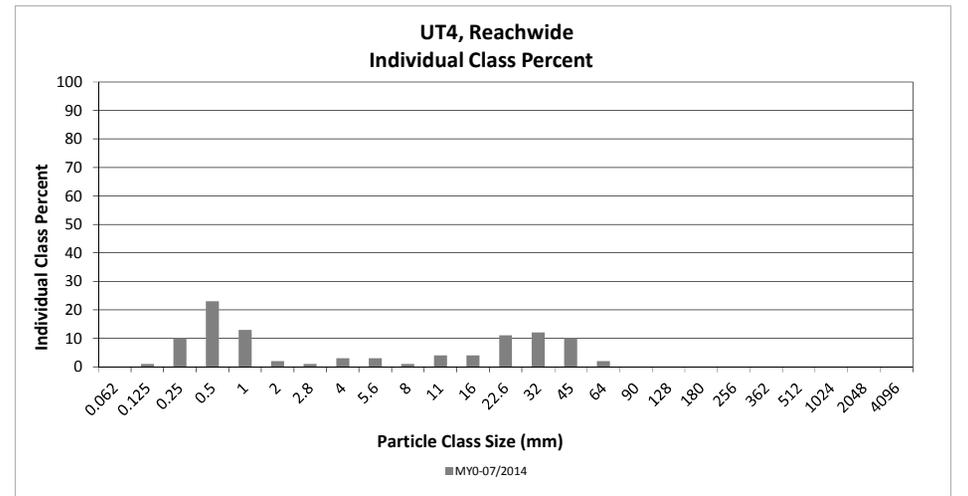
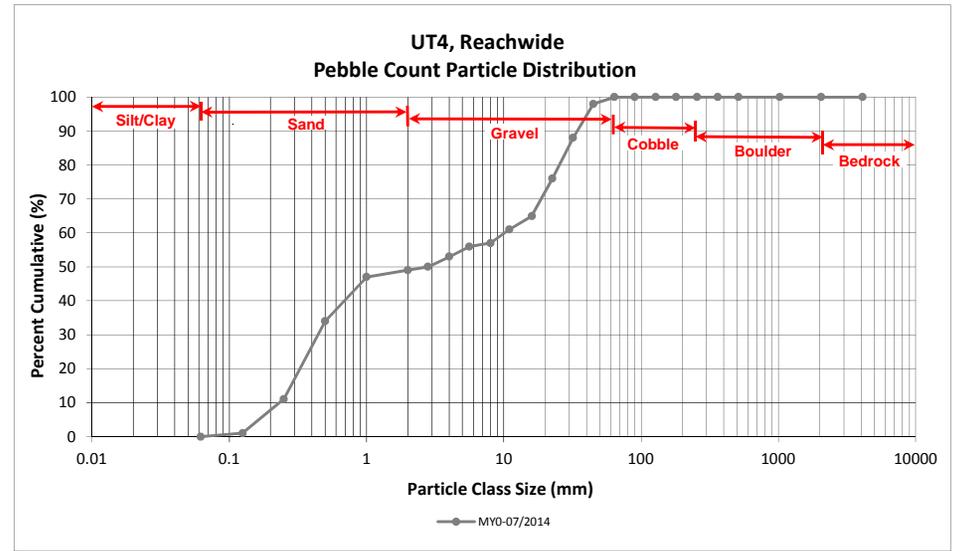
The survey was exported from Right to Left

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes	751.15	stage
		0.00	760.398	<input type="checkbox"/>	(XS21)XS21	760.398	760.398
		56.12	759.232	<input type="checkbox"/>	(XS21)XS21	759.232	759.232
		114.82	757.415	<input type="checkbox"/>	(XS21)XS21	757.415	757.415
		146.90	757.058	<input type="checkbox"/>	(XS21)XS21	757.058	757.058
		170.19	756.536	<input type="checkbox"/>	(XS21)XS21	756.536	756.536
		180.41	756.509	<input type="checkbox"/>	(XS21)XS21	756.509	756.509
		198.28	756.625	<input type="checkbox"/>	(XS21)XS21	756.625	756.625
		214.72	756.392	<input type="checkbox"/>	(XS21)XS21	756.392	756.392
		221.44	756.012	<input type="checkbox"/>	(XS21 RTB)>	756.012	756.012
		221.95	755.408	<input type="checkbox"/>	(XS21)XS21	755.408	755.408
		223.01	751.39	<input type="checkbox"/>	(XS21)XS21	751.39	751.39
		223.83	750.954	<input type="checkbox"/>	(XS21)XS21	750.954	750.954
		225.30	750.04	<input type="checkbox"/>	(XS21 REW)	750.04	750.04
		225.48	750.043	<input type="checkbox"/>	(XS21)XS21	750.043	750.043
		226.01	749.828	<input type="checkbox"/>	(XS21)XS21	749.828	749.828
		226.86	749.818	<input type="checkbox"/>	(XS21 TWG)	749.818	749.818
		227.57	749.934	<input type="checkbox"/>	(XS21)XS21	749.934	749.934
		228.27	750.107	<input type="checkbox"/>	(XS21 LEW)	750.107	750.107
		228.94	750.336	<input type="checkbox"/>	(XS21)XS21	750.336	750.336
		230.74	750.385	<input type="checkbox"/>	(XS21 LCH)>	750.385	750.385
		230.95	751.386	<input type="checkbox"/>	(XS21)XS21	751.386	751.386
		235.00	752.598	<input type="checkbox"/>	(XS21)XS21	752.598	752.598
		238.68	753.17	<input type="checkbox"/>	(XS21)XS21	753.17	753.17
		240.15	755.917	<input type="checkbox"/>	(XS21 LTB)X	755.917	755.917
		242.43	756.498	<input type="checkbox"/>	(XS21)XS21	756.498	756.498
		246.69	756.529	<input type="checkbox"/>	(XS21)XS21	756.529	756.529
		254.87	756.39	<input type="checkbox"/>	(XS21)XS21	756.39	756.39
		268.94	757.544	<input type="checkbox"/>	(XS21)XS21	757.544	757.544
		282.61	758.931	<input type="checkbox"/>	(XS21)XS21	758.931	758.931
		287.16	762.014	<input type="checkbox"/>	(XS21 POOL)	762.014	762.014

Reachwide and Cross Section Pebble Count Plots
 Candy Creek Mitigation Site
 Existing Conditions - 2014
 UT4, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062					0
SAND	Very fine	0.062	0.125		1	1	1	1
	Fine	0.125	0.250	2	8	10	10	11
	Medium	0.25	0.50	2	21	23	23	34
	Coarse	0.5	1.0		13	13	13	47
	Very Coarse	1.0	2.0	1	1	2	2	49
GRAVEL	Very Fine	2.0	2.8	1		1	1	50
	Very Fine	2.8	4.0	3		3	3	53
	Fine	4.0	5.6		3	3	3	56
	Fine	5.6	8.0	1		1	1	57
	Medium	8.0	11.0	4		4	4	61
	Medium	11.0	16.0	4		4	4	65
	Coarse	16.0	22.6	11		11	11	76
	Coarse	22.6	32	11	1	12	12	88
	Very Coarse	32	45	9	1	10	10	98
	Very Coarse	45	64	1	1	2	2	100
COBBLE	Small	64	90					100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				50	50	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	0.29
D ₃₅ =	0.53
D ₅₀ =	2.8
D ₈₄ =	28.5
D ₉₅ =	40.6
D ₁₀₀ =	64.0



Reachwide and Cross Section Pebble Count Plots

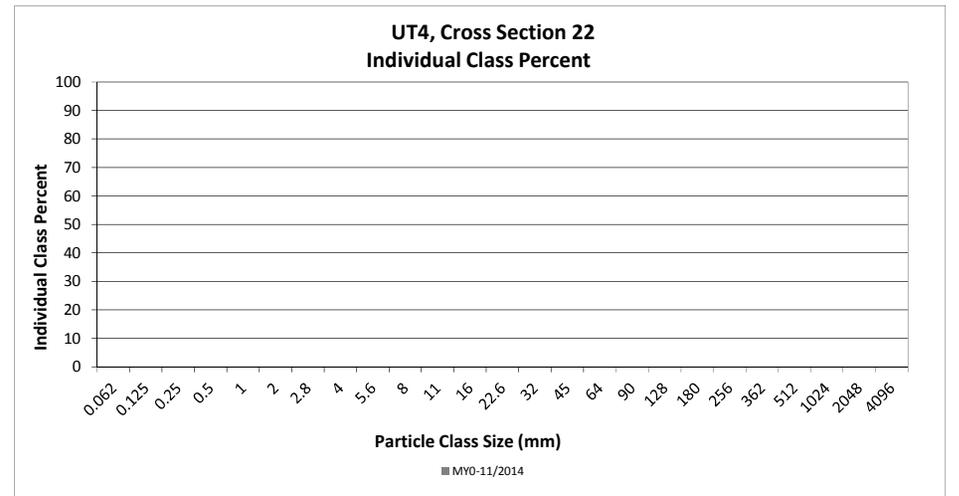
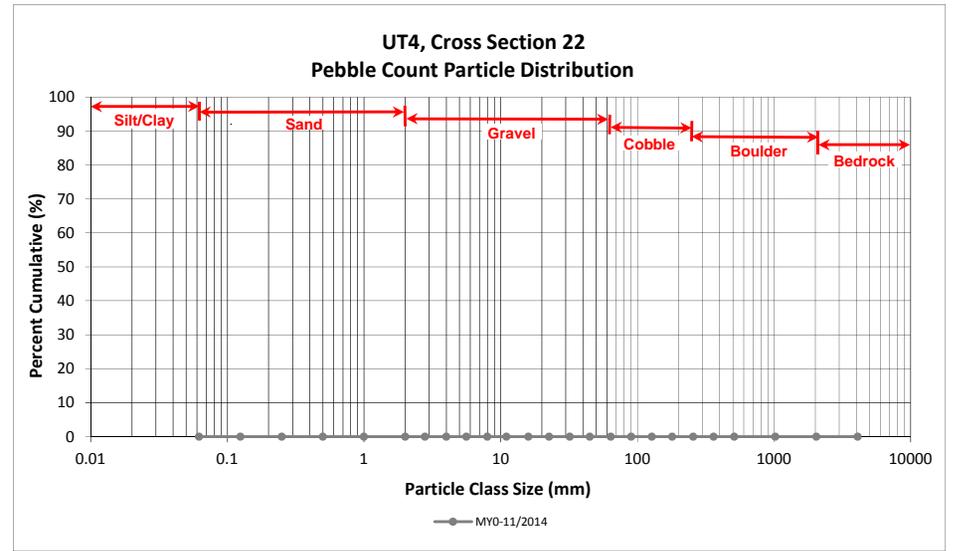
Candy Creek Mitigation Site

Existing Conditions - 2014

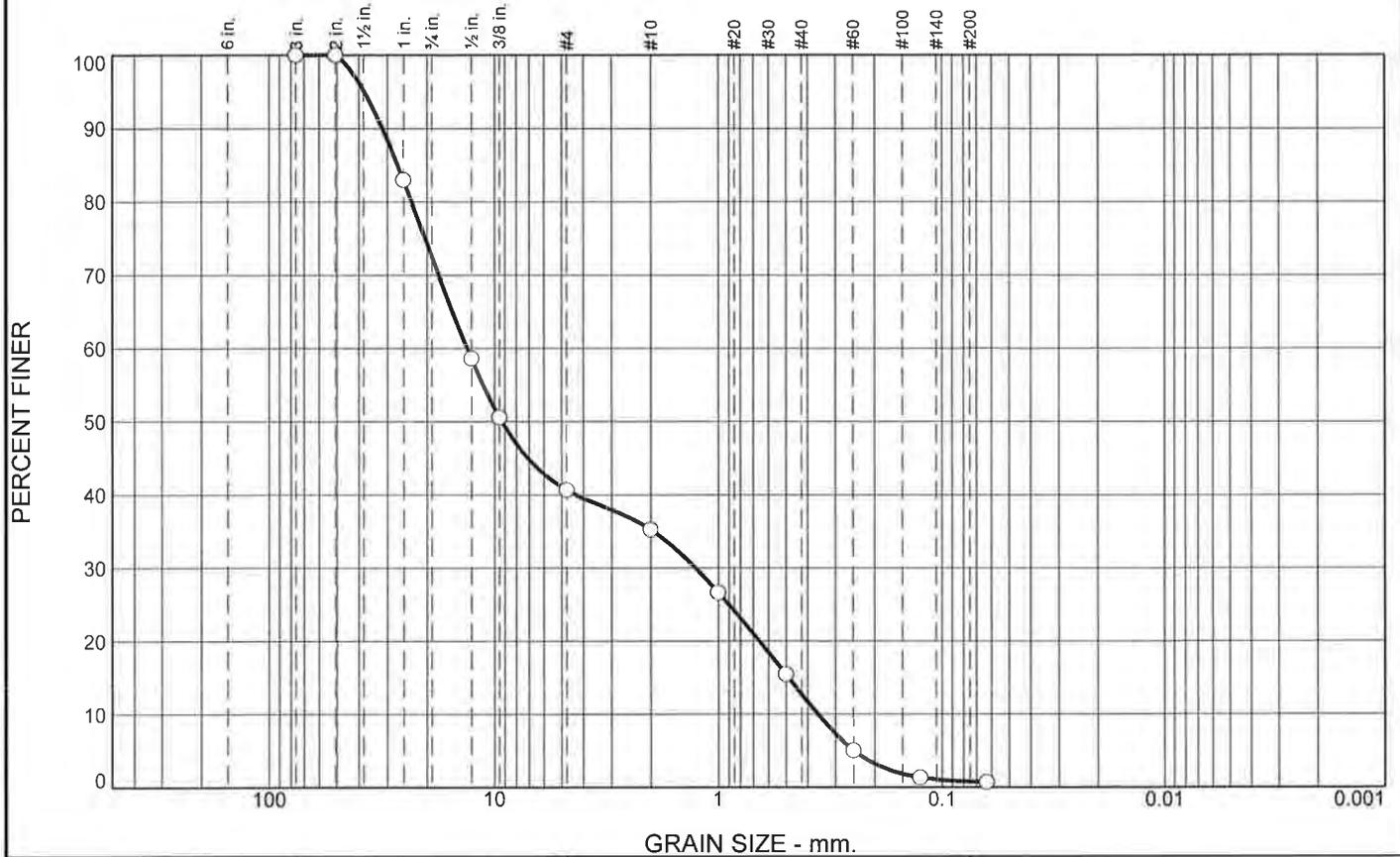
UT4, Cross Section 22

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			#DIV/0!
SAND	Very fine	0.062	0.125			#DIV/0!
	Fine	0.125	0.250			#DIV/0!
	Medium	0.25	0.50			#DIV/0!
	Coarse	0.5	1.0			#DIV/0!
	Very Coarse	1.0	2.0			#DIV/0!
GRAVEL	Very Fine	2.0	2.8			#DIV/0!
	Very Fine	2.8	4.0			#DIV/0!
	Fine	4.0	5.6			#DIV/0!
	Fine	5.6	8.0			#DIV/0!
	Medium	8.0	11.0			#DIV/0!
	Medium	11.0	16.0			#DIV/0!
	Coarse	16.0	22.6			#DIV/0!
	Coarse	22.6	32			#DIV/0!
	Very Coarse	32	45			#DIV/0!
	Very Coarse	45	64			#DIV/0!
COBBLE	Small	64	90			#DIV/0!
	Small	90	128			#DIV/0!
	Large	128	180			#DIV/0!
	Large	180	256			#DIV/0!
BOULDER	Small	256	362			#DIV/0!
	Small	362	512			#DIV/0!
	Medium	512	1024			#DIV/0!
	Large/Very Large	1024	2048			#DIV/0!
BEDROCK	Bedrock	2048	>2048			#DIV/0!
Total				0	0	#DIV/0!

Cross Section 22	
Channel materials (mm)	
D ₁₆ =	Silt/Clay
D ₃₅ =	Silt/Clay
D ₅₀ =	Silt/Clay
D ₈₄ =	#N/A
D ₉₅ =	#N/A
D ₁₀₀ =	#N/A



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	27.4	31.9	5.5	22.5	11.9	0.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	82.9		
0.5	58.6		
0.375	50.6		
#4	40.7		
#10	35.2		
#18	26.6		
#35	15.4		
#60	5.1		
#120	1.3		
#230	0.7		

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 31.5371 D₈₅= 27.0156 D₆₀= 13.2553

D₅₀= 9.2914 D₃₀= 1.2666 D₁₅= 0.4883

D₁₀= 0.3605 C_u= 36.77 C_c= 0.34

Classification

USCS= GP AASHTO=

Remarks

Secondary Axis: 2.31", 2.10"
Total Weight: 2032.15g

* (no specification provided)

Location: UT-4 XS-22, Riffle Subpav 7/11, IE/EN

Date: 08-11-14

<p style="text-align: center; font-size: 1.2em;">Summit Engineering</p> <p style="text-align: center; font-size: 1.2em;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p> <p style="text-align: right;">Figure</p>
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Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/18/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UT-4 XS-22, Riffle Subpav 7/11, IE/EN

Date: 08-11-14

USCS Classification: GP

Testing Remarks: Secondary Axis: 2.31", 2.10"

Total Weight: 2032.15g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2032.15	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	347.81	82.9
			0.5	840.72	58.6
			0.375	1004.35	50.6
			#4	1205.83	40.7
			#10	1316.80	35.2
			#18	1491.60	26.6
			#35	1719.20	15.4
			#60	1928.50	5.1
			#120	2005.70	1.3
			#230	2017.90	0.7

Fractional Components

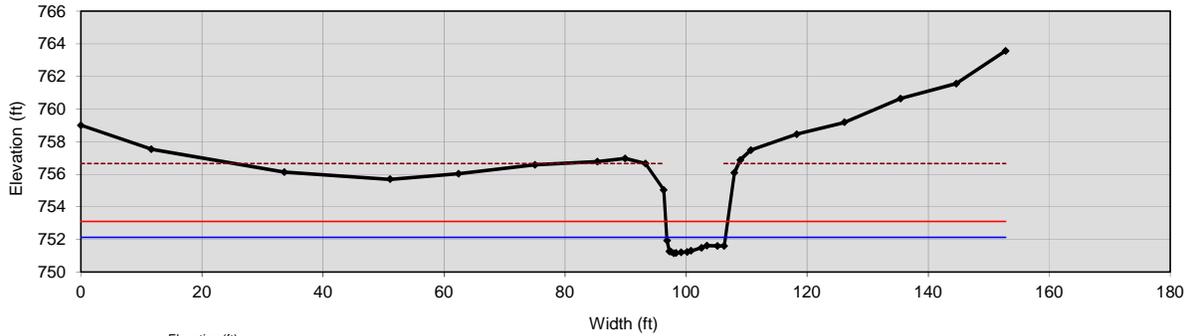
Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	27.4	31.9	59.3	5.5	22.5	11.9	39.9			0.8

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.3605	0.4883	0.6587	1.2666	9.2914	13.2553	23.3972	27.0156	31.5371	37.8198

Fineness Modulus	C _u	C _c
5.48	36.77	0.34

Cross Section 23

UT5, riffle



Bankfull Dimensions

6.7	x-section area (ft.sq.)
9.5	width (ft)
0.7	mean depth (ft)
1.0	max depth (ft)
10.1	wetted parimeter (ft)
0.7	hyd radi (ft)
13.4	width-depth ratio

Flood Dimensions

10.2	W flood prone area (ft)
1.1	entrenchment ratio
5.5	low bank height (ft)
5.6	low bank height ratio

Materials

19	D50 Riffle (mm)
39	D84 Riffle (mm)
19	threshold grain size (mm):

Bankfull Flow

3.3	velocity (ft/s)
22.0	discharge rate (cfs)
0.70	Froude number

Flow Resistance

0.034	Manning's roughness
0.15	D'Arcy-Weisbach fric.
7.3	resistance factor u/u*
5.5	relative roughness

Forces & Power

0.93	channel slope (%)
0.39	shear stress (lb/sq.ft.)
0.45	shear velocity (ft/s)
1.35	unit strm power (lb/ft/s)

Cross Section

reference ID

longitudinal station

alignment

feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

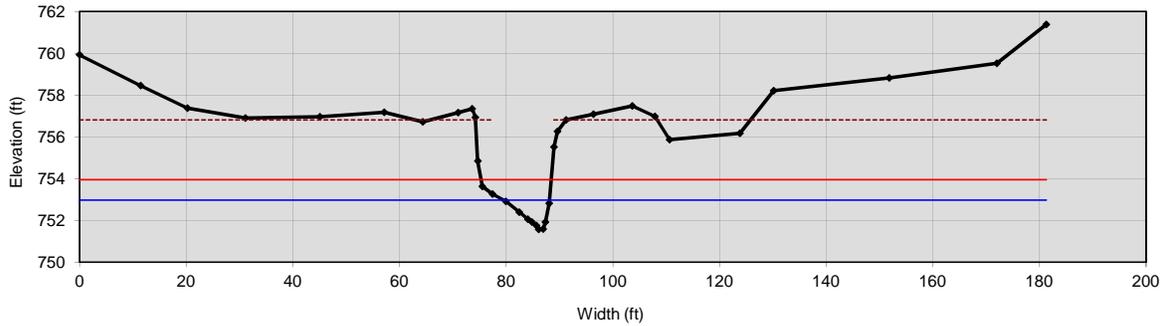
D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	758.993	<input type="checkbox"/>	(XS23 Riffle)
		11.59	757.533	<input type="checkbox"/>	(XS23)XS23
		33.59	756.126	<input type="checkbox"/>	(XS23)XS23
		51.08	755.689	<input type="checkbox"/>	(XS23)XS23
		62.40	756.028	<input type="checkbox"/>	(XS23)XS23
		75.00	756.573	<input type="checkbox"/>	(XS23)XS23
		85.32	756.774	<input type="checkbox"/>	(XS23)XS23
		89.92	756.96	<input type="checkbox"/>	(XS23)XS23
		93.27	756.649	<input type="checkbox"/>	(XS23 LTB))
		96.30	755.04	<input type="checkbox"/>	(XS23)XS23
		96.84	751.929	<input type="checkbox"/>	(XS23)XS23
		97.23	751.263	<input type="checkbox"/>	(XS23 LCH)
		97.50	751.248	<input type="checkbox"/>	(XS23 LEW)
		97.98	751.147	<input type="checkbox"/>	(XS23)XS23
		98.32	751.167	<input type="checkbox"/>	(XS23 TWG)
		99.18	751.213	<input type="checkbox"/>	(XS23)XS23
		100.16	751.235	<input type="checkbox"/>	(XS23)XS23
		100.80	751.297	<input type="checkbox"/>	(XS23 REW)
		102.51	751.477	<input type="checkbox"/>	(XS23)XS23
		103.45	751.622	<input type="checkbox"/>	(XS23)XS23
		105.17	751.591	<input type="checkbox"/>	(XS23)XS23
		106.29	751.603	<input type="checkbox"/>	(XS23 RCH)
		107.98	756.088	<input checked="" type="checkbox"/>	(XS23)XS23
		108.94	756.874	<input type="checkbox"/>	(XS23)XS23
		110.71	757.482	<input type="checkbox"/>	(XS23 RTB)
		118.28	758.459	<input type="checkbox"/>	(XS23)XS23
		126.18	759.183	<input type="checkbox"/>	(XS23)XS23
		135.42	760.637	<input type="checkbox"/>	(XS23)XS23
		144.61	761.554	<input type="checkbox"/>	(XS23)XS23
		152.77	763.557	<input type="checkbox"/>	(XS23)XS23
				<input type="checkbox"/>	
				<input type="checkbox"/>	
				<input type="checkbox"/>	

Cross Section 24

UT5, pool



Bankfull Dimensions

6.4	x-section area (ft.sq.)
8.7	width (ft)
0.7	mean depth (ft)
1.4	max depth (ft)
9.5	wetted parimeter (ft)
0.7	hyd radi (ft)
11.7	width-depth ratio

Flood Dimensions

13.1	W flood prone area (ft)
1.5	entrenchment ratio
5.2	low bank height (ft)
3.7	low bank height ratio

Materials

19	D50 Riffle (mm)
39	D84 Riffle (mm)
19	threshold grain size (mm):

Bankfull Flow

3.4	velocity (ft/s)
22.0	discharge rate (cfs)
0.73	Froude number

Flow Resistance

0.032	Manning's roughness
0.14	D'Arcy-Weisbach fric.
7.6	resistance factor u/u*
5.8	relative roughness

Forces & Power

0.93	channel slope (%)
0.39	shear stress (lb/sq.ft.)
0.45	shear velocity (ft/s)
1.47	unit strm power (lb/ft/s)

Cross Section

reference ID
 longitudinal station
 alignment
 feature

Bankfull Stage

elevation

Low Bank Height

elevation

Flood Prone Area

width fpa

Channel Slope

percent slope

Flow Resistance

Manning's "n"

D'Arcy - Weisbach "f"

Note:

easting (ft)	northing (ft)	Distance (ft)	Elevation (ft)	Omit Bkf	Notes
		0.00	759.925	<input type="checkbox"/>	(XS24 Pool)
		11.43	758.459	<input type="checkbox"/>	(XS24)XS24
		20.22	757.369	<input type="checkbox"/>	(XS24)XS24
		31.10	756.899	<input type="checkbox"/>	(XS24)XS24
		45.05	756.965	<input type="checkbox"/>	(XS24)XS24
		57.14	757.178	<input type="checkbox"/>	(XS24)XS24
		64.36	756.713	<input type="checkbox"/>	(XS24)XS24
		70.99	757.156	<input type="checkbox"/>	(XS24)XS24
		73.63	757.345	<input type="checkbox"/>	(XS24 LTB)
		74.22	756.931	<input type="checkbox"/>	(XS24)XS24
		74.66	754.85	<input type="checkbox"/>	(XS24)XS24
		75.53	753.63	<input type="checkbox"/>	(XS24)XS24
		77.46	753.261	<input type="checkbox"/>	(XS24)XS24
		79.92	752.906	<input type="checkbox"/>	(XS24 BKF-I
		82.44	752.401	<input type="checkbox"/>	(XS24)XS24
		84.09	752.054	<input type="checkbox"/>	(XS24 LCH)
		84.83	751.914	<input type="checkbox"/>	(XS24 LEW)
		85.70	751.749	<input type="checkbox"/>	(XS24)XS24
		86.12	751.576	<input type="checkbox"/>	(XS24 TWG)
		86.91	751.592	<input type="checkbox"/>	(XS24)XS24
		87.37	751.914	<input type="checkbox"/>	(XS24 REW)
		88.07	752.816	<input type="checkbox"/>	(XS24)XS24
		88.95	755.521	<input type="checkbox"/>	(XS24)XS24
		89.62	756.261	<input type="checkbox"/>	(XS24)XS24
		91.21	756.815	<input type="checkbox"/>	(XS24 RTB)
		96.39	757.089	<input type="checkbox"/>	(XS24)XS24
		103.66	757.485	<input type="checkbox"/>	(XS24)XS24
		107.86	756.976	<input type="checkbox"/>	(XS24)XS24
		110.63	755.865	<input type="checkbox"/>	(XS24)XS24
		123.82	756.173	<input type="checkbox"/>	(XS24)XS24
		130.19	758.208	<input type="checkbox"/>	(XS24)XS24
		151.86	758.826	<input type="checkbox"/>	(XS24)XS24
		172.01	759.522	<input type="checkbox"/>	(XS24)XS24
		181.27	761.376	<input type="checkbox"/>	(XS24)XS24

Reachwide and Cross Section Pebble Count Plots

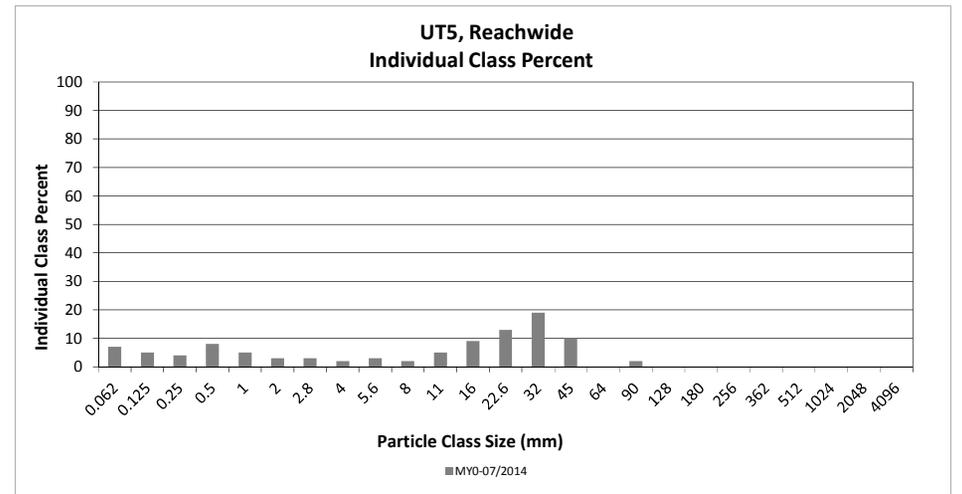
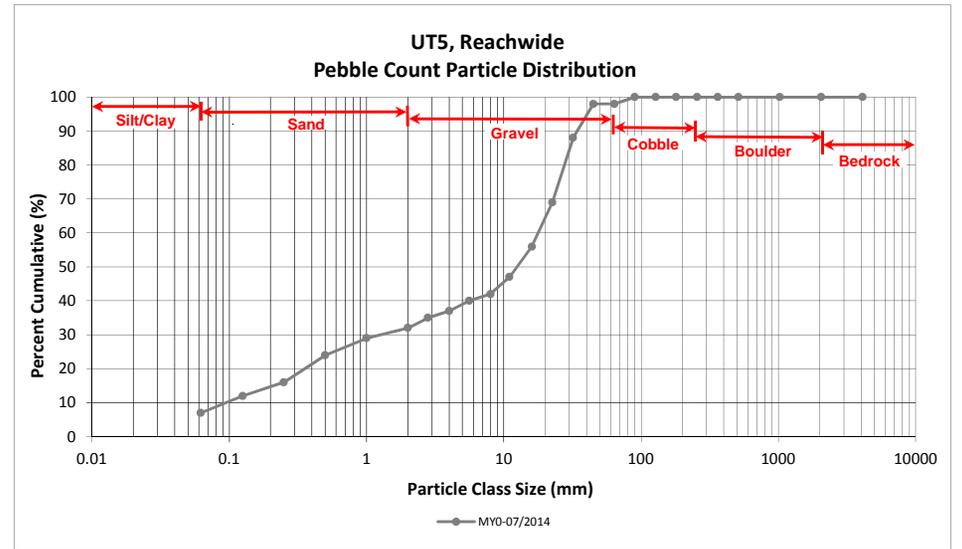
Candy Creek Mitigation Site

Existing Conditions - 2014

UT5, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	5	7	7	7
SAND	Very fine	0.062	0.125	1	4	5	5	12
	Fine	0.125	0.250	1	3	4	4	16
	Medium	0.25	0.50	2	6	8	8	24
	Coarse	0.5	1.0		5	5	5	29
	Very Coarse	1.0	2.0		3	3	3	32
GRAVEL	Very Fine	2.0	2.8	2	1	3	3	35
	Very Fine	2.8	4.0		2	2	2	37
	Fine	4.0	5.6		3	3	3	40
	Fine	5.6	8.0	2		2	2	42
	Medium	8.0	11.0	4	1	5	5	47
	Medium	11.0	16.0	4	5	9	9	56
	Coarse	16.0	22.6	13		13	13	69
	Coarse	22.6	32	19		19	19	88
	Very Coarse	32	45	8	2	10	10	98
	Very Coarse	45	64					98
COBBLE	Small	64	90	2		2	2	100
	Small	90	128					100
	Large	128	180					100
	Large	180	256					100
Boulder	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
Total				60	40	100	100	100

Reachwide	
Channel materials (mm)	
D ₁₆ =	0.25
D ₃₅ =	2.80
D ₅₀ =	12.5
D ₈₄ =	29.7
D ₉₅ =	40.6
D ₁₀₀ =	90.0



Reachwide and Cross Section Pebble Count Plots

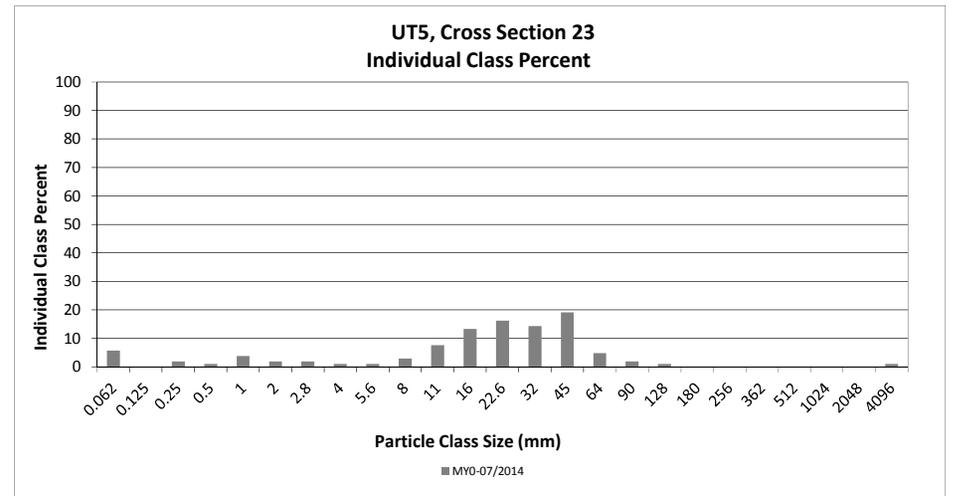
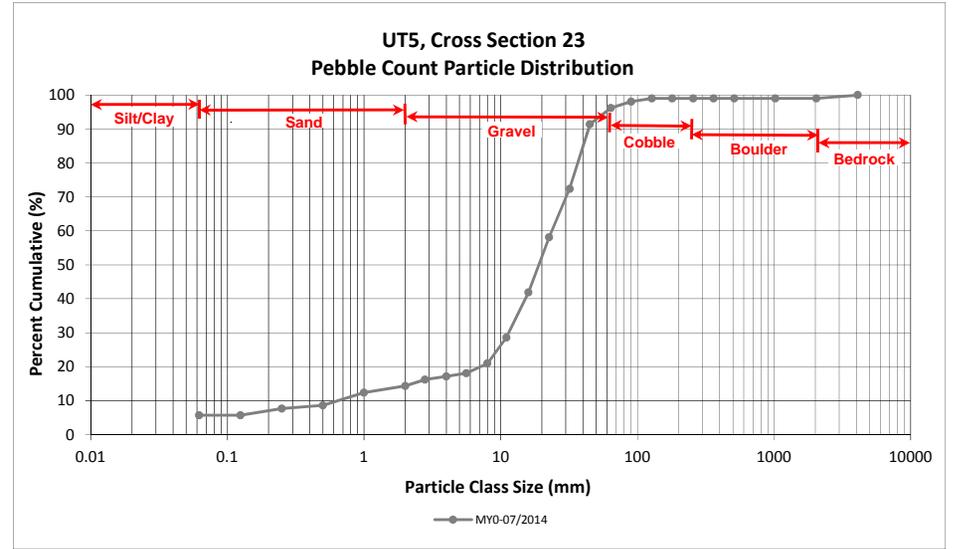
Candy Creek Mitigation Site

Existing Conditions - 2014

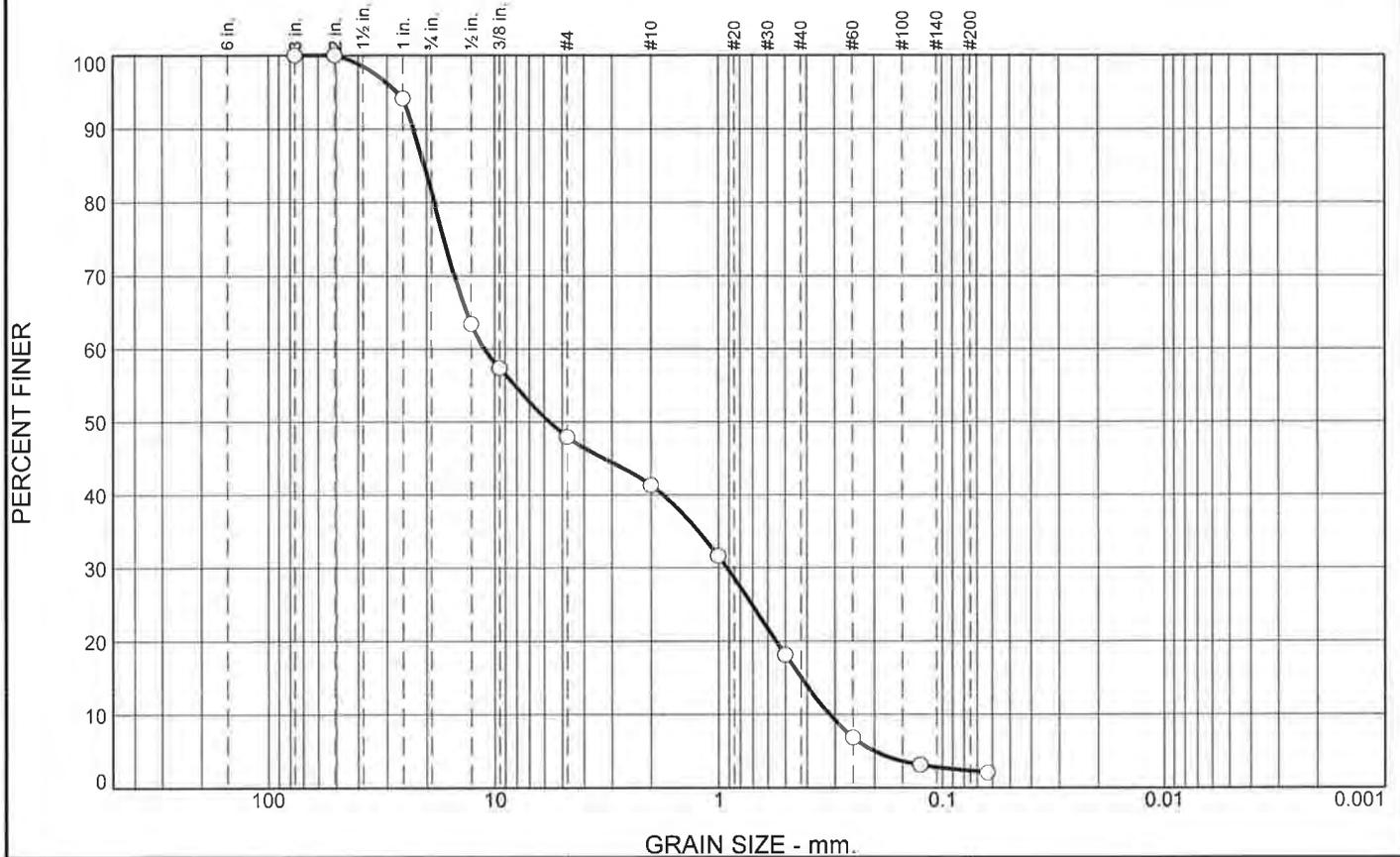
UT5, Cross Section 23

Particle Class		Diameter (mm)		Riffle 100-Count	Summary	
		min	max		Class Percentage	Percent Cumulative
<i>SILT/CLAY</i>	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250	2	2	8
	Medium	0.25	0.50	1	1	9
	Coarse	0.5	1.0	4	4	12
	Very Coarse	1.0	2.0	2	2	14
GRAVEL	Very Fine	2.0	2.8	2	2	16
	Very Fine	2.8	4.0	1	1	17
	Fine	4.0	5.6	1	1	18
	Fine	5.6	8.0	3	3	21
	Medium	8.0	11.0	8	8	29
	Medium	11.0	16.0	14	13	42
	Coarse	16.0	22.6	17	16	58
	Coarse	22.6	32	15	14	72
	Very Coarse	32	45	20	19	91
	Very Coarse	45	64	5	5	96
COBBLE	Small	64	90	2	2	98
	Small	90	128	1	1	99
	Large	128	180			99
	Large	180	256			99
BOULDER	Small	256	362			99
	Small	362	512			99
	Medium	512	1024			99
	Large/Very Large	1024	2048			99
BEDROCK	Bedrock	2048	>2048	1	1	100
Total				105	100	100

Cross Section 23	
Channel materials (mm)	
D ₁₆ =	2.71
D ₃₅ =	13.18
D ₅₀ =	19.0
D ₈₄ =	39.4
D ₉₅ =	58.6
D ₁₀₀ =	>2048



Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.4	33.6	6.7	26.3	12.7	2.3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
2	100.0		
1	94.1		
0.5	63.4		
0.375	57.4		
#4	48.0		
#10	41.3		
#18	31.6		
#35	18.1		
#60	6.9		
#120	3.1		
#230	2.1		

* (no specification provided)

Material Description

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₉₀= 22.7815 D₈₅= 20.3998 D₆₀= 11.0986

D₅₀= 5.6975 D₃₀= 0.9159 D₁₅= 0.4252

D₁₀= 0.3169 C_u= 35.02 C_c= 0.24

Classification

USCS= GP AASHTO=

Remarks

Secondary Axis: 1.53", 1.84"

Total Weight: 1651.27g

Location: UT-5 Pavement, IE/EN 7/10

Date: 08-18-14

<p style="text-align: center; font-size: large; font-weight: bold;">Summit Engineering</p> <p style="text-align: center; font-size: large; font-weight: bold;">Ft. Mill, South Carolina</p>	<p>Client: Wildlands Engineering</p> <p>Project: Candy Creek</p> <p>Project No: SL-262-11</p>
<p>Figure</p>	

Tested By: Mimi Hourani

GRAIN SIZE DISTRIBUTION TEST DATA

8/18/2014

Client: Wildlands Engineering

Project: Candy Creek

Project Number: SL-262-11

Location: UT-5 Pavement, IE/EN 7/10

Date: 08-18-14

USCS Classification: GP

Testing Remarks: Secondary Axis: 1.53", 1.84"

Total Weight: 1651.27g

Tested by: Mimi Hourani

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1651.27	0.00	0.00	3	0.00	100.0
			2	0.00	100.0
			1	98.13	94.1
			0.5	604.33	63.4
			0.375	703.80	57.4
			#4	859.17	48.0
			#10	969.30	41.3
			#18	1129.50	31.6
			#35	1352.40	18.1
			#60	1537.30	6.9
			#120	1600.10	3.1
			#230	1616.60	2.1

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	18.4	33.6	52.0	6.7	26.3	12.7	45.7			2.3

D ₁₀	D ₁₅	D ₂₀	D ₃₀	D ₅₀	D ₆₀	D ₈₀	D ₈₅	D ₉₀	D ₉₅
0.3169	0.4252	0.5505	0.9159	5.6975	11.0986	18.4390	20.3998	22.7815	27.2462

Fineness Modulus	C _u	C _c
5.03	35.02	0.24

Appendix 6: HEC-20 Channel Stability Assessment Data

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Stream: UTZ - combined above and below
 Reach:
 Date: 7/16/2014
 Weather: Partly Clouds High 70s
 Location:

Observers: IE, JTB
 Project: Cond. Geol.
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy, flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	2
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	7
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	9
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	9
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	5

47

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay; cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	7
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	11
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	8
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	9
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by lenson cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	7
13. Upsream distance to bridge from remainder in reach; path and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow, or flow alignment is otherwise not centered beneath bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, FS = fraction of sand, S = slope, w/y = width-to-depth ratio

Total Score 87

75

Stream: 6172.0
 Reach:
 Date: 7/16
 Weather: Partly cloudy, 79° 38° humidity
 Location:

Observers: EE, KB
 Project: Candy Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy, flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	2
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (stop-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	6
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	7
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	9
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles; but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	3
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	4

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	7
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-80% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in places on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	9
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	6
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	5
13. Upstream distance to bridge from meander throat and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow or flow alignment is otherwise not centered between bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wly = width-to-depth ratio

Total Score

75

79

Stream: LA726
 Reach:
 Date: 7/16/2014
 Weather: Partly cloudy 76°
 Location:

Observers: JJ, KB
 Project: Cowby Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1 - 3)	Good (4 - 6)	Fair (7 - 9)	Poor (10 - 12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	3
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool) system, narrow valley, stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	7
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	5
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	10
6. Bar development	For S < 0.02 and wy > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wy are < 12, no bars are evident	For S < 0.02 and wy > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wy < 12, no bars are evident	For S < 0.02 and wy > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wy < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wy > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	4

-Deer pollin
 -No channel
 -Pockets of instability

44

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay/loam; minor amounts of noncohesive or unconsolidated materials; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated materials	Loamy sand to sand, noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	9
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	7
11. Bank cutting	Little or none evident. Infrequent raw banks. Insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	7
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	5
13. Upstream distance to bridge from meander impact point and alignment	More than 35 m; bridge is well-aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow or flow alignment is otherwise not centered beneath bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wty = width-to-depth ratio

Total Score

79

84

Stream: U14
 Reach:
 Date: 7/16/2017
 Weather: Mostly Sunny, W, 70's
 Location:

Observers: JL, KB
 Project:
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), deforestation, logging, or other minor activities. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	6
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent; mode of discharge; ephemeral stream other than first-order stream	2
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	8
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	9
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	7
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revelements, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	6

46

Stability Indicator	Excellent (1 - 3)	Good (4 - 6)	Fair (7 - 9)	Poor (10 - 12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	6
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation leading in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	8
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	7
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	7
13. Upstream distance to bridge from meander in main plan, and alignment aligned with river flow	More than 35 m; bridge is well-aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow, or flow alignment is otherwise not completed, perpendicular	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wly = width-to-depth ratio

Total Score

84

Good but for but limited
armoring, some here
leaning over channel

87

Stream: UTS
 Reach:
 Date: 7/16/2014
 Weather: Mostly Sunny Low 82S
 Location:

Observers: IL, KB
 Project: Candy Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; fresh floods prevalent mode of discharge; ephemeral stream other than first-order stream	2
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	8
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	9
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	8
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revelements, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	5

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay; cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	6
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 50% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-80% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	10
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	9
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	8
13. Upstream distance to bridge from in-stream impact point and alignment aligned with river flow	More than 36 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow; or flow alignment is otherwise not centered, skewed, bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, w/y = width-to-depth ratio

Total Score 89

Stream: CC
 Reach: R2
 Date: 7/16/14
 Weather: Sunny
 Location: Coy

Observers: Scott & Coy
 Project: Coy Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	10
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	5
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	9
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knicpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	10
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	10
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	11
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions; cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	8

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated materials exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	10
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (16°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.6:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primary hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	10
11. Bank cutting	Little or none evident. Infrequent raw banks. Insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	9
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	9
13. Upstream distance to bridge from in-stream impact point and alignment	More than 35 m; bridges well-aligned with near-flow	20-35 m; bridges is aligned with flow	10-20 m; bridges skewed to flow or flow alignment is otherwise not controlled beneath bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wly = width-to-depth ratio

Total Score

11

Stream: JTB
 Reach:
 Date: 7/16/14
 Weather: Sunny
 Location:

Observers: Scott/CG
 Project: C-007
 Drainage Area:
 Stream Type

49

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanized or rapidly urbanizing watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	6
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	4
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	9
4. Enrichment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-loop-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	10
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	8
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	5
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revelements, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	6

46
38

Stability Indicator	Excellent (1 - 3)	Good (4 - 6)	Fair (7 - 9)	Poor (10 - 12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	10
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	6
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and soil-root overhangs	6
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	6
13. Upstream distance to bridge from meaner impact point and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow; or flow alignment is otherwise not centered by main channel	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wly = width-to-depth ratio

Total Score

36

CC R2

Stream: ST1
 Reach: C
 Date: 7/16/14
 Weather: Slightly overcast
 Location: Candy

Observers: Scott & Cory
 Project: Candy Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	5
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	3
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	6
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	11
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	9
6. Bar development	For S < 0.02 and wy > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wy are < 12, no bars are evident	For S < 0.02 and wy > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wy < 12, no bars are evident	For S < 0.02 and wy > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wy < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wy > 12	5
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revelements, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	5

Stability Indicator	Excellent (1 - 3)	Good (4 - 6)	Fair (7 - 9)	Poor (10 - 12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	10
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.6:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	11
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	8
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	10
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	9
13. Upstream distance to bridges from meander in best main channel alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow or flow alignment is otherwise not centered beneath bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, FS = fraction of sand, S = slope, w/y = width-to-depth ratio

Total Score

91

267
46

Stream: DTI
 Reach: D
 Date: 7/16/14
 Weather: sunny
 Location: County Creek

Observers: Scott Coyle
 Project: County Creek
 Drainage Area:
 Stream Type

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	11
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	5
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool) system, narrow valley, stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	9
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	6
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	12
6. Bar development	For S < 0.02 and w/y > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and w/y are < 12, no bars are evident	For S < 0.02 and w/y > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and w/y < 12, no bars are evident	For S < 0.02 and w/y > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and w/y < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and w/y > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	None or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	3

active pasture in 1/2 = 1 headwaters

W/S dem = poor DIS " = 6 and

Breakdown independent e pond.

Stability Indicator	Excellent (1 - 3)			Good (4 - 6)		Fair (7 - 9)		Poor (10 - 12)		Score
	8. Bank soil texture and coherence	9. Average bank slope angle (where 90° is a vertical bank)	10. Vegetative or engineered bank protection	Clay loam to silty clay; cohesive material amounts or noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	
8. Bank soil texture and coherence	Clay and silty clay; cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (16°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes < 3H:1V (16°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, lined with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	10
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, lined with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	9
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and soil-root overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and soil-root overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and soil-root overhangs	7
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	7
13. Upstream distance to bridge from incision in span (point and segment)	More than 35 m; bridge is well aligned with river flow	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow, or low alignment is observed; not centered by valley bridge	Less than 10 m; bridge is poorly aligned with flow	Less than 10 m; bridge is poorly aligned with flow	Less than 10 m; bridge is poorly aligned with flow	Less than 10 m; bridge is poorly aligned with flow	7

H = horizontal, V = vertical, S = slope, wy = width-to-depth ratio

Total Score

97

W/S sand = poor
D/S = Fair

333

Stream: Candy Creek
 Reach: Reach 1, 4
 Date: 7/8/14
 Weather: 95°, Partly Cloudy
 Location: Gwinnett County

Observers: J Eckard
 Project: Candy Creek
 Drainage Area:
 Stream Type

Excellent (1-3)		Good (4-6)		Fair (7-9)		Poor (10-12)		Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed				7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream				1
3. Channel pattern	No evidence of channelization, meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.				10
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge				6
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized lightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no pecking. Large amounts of material < 4 mm. Fs > 70%				12
6. Bar development	For S < 0.02 and wy > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wy are < 12, no bars are evident	For S < 0.02 and wy > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wy < 12, no bars are evident	For S < 0.02 and wy > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wy < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wy > 12				8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen				4

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	10
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	11
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 80% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-80% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90° from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	10
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	9
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by tension cracks, massive undercutting, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	9
13. Upstream distance to bridge from nearest impact point and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow, or flow alignment is otherwise not controlled by nearby bridge	Less than 10 m; bridge is poorly aligned with flow	

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wy = width-to-depth ratio

Total Score

49

97

Stream: Cundy Creek
 Reach: Reach 1
 Date: 7/9/14
 Weather: partly cloudy, 85°
 Location:

Observers: J Eckardt
 Project: Cundy Creek
 Drainage Area: 3.04
 Stream Type: C

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	8
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	1
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	11
4. Entrenchment/ channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently reobuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	10
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no pecking. Large amounts of material < 4 mm. Fs > 70%	9
6. Bar development	For S < 0.02 and wy > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wy are < 12, no bars are evident	For S < 0.02 and wy > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wy < 12, no bars are evident	For S < 0.02 and wy > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wy < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wy > 12	7
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	7

Doesn't appear channelized but very unstable laterally. Headcut near v/s end. Highly incised > 3 BHR

Some obstructing

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
8. Bank soil texture and coherence	Clay and silty clay; cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	9
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes over 45° in noncohesive or unconsolidated materials or over 60° in clays common on one or both banks	11
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 50% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Woody vegetation band may vary depending on age and health with less than 50% plant density and cover. Primarily soft wood, piney, coniferous trees with very young, old and dying, and/or monostand vegetation located off of the bank. Woody vegetation oriented at less than 70% from horizontal with extensive root exposure. No lining or armoring of banks	11
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Almost continuous cuts on both banks, some extending over most of the banks. Undercutting and sod-root overhangs	11
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Frequent and extensive mass wasting. The potential for bank failure, as evidenced by lenson cracks, massive undercuttings, and bank slumping is considerable. Channel width is highly irregular, and banks are scalloped	11
13. Upstream distance to bridge from minor impact point and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow, or flow alignment is otherwise not centered by road bridge	Less than 10 m; bridge is poorly aligned with flow	

Majority of banks are bare. No herbs & few trees. Buffer well positioned but doesn't provide bank protection.

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, w/y = width-to-depth ratio

Total Score

53

106

Stream: Candy Creek
 Reach: Reach 13
 Date: 7/15/14
 Weather: 90°/overcast
 Location:

Observers: IE/KB/SG/CM
 Project
 Drainage Area:
 Stream Type

Overland flow
 in fields

Stability Indicator	Excellent (1-3)	Good (4-6)	Fair (7-9)	Poor (10-12)	Score
1. Watershed and flood plain activity and characteristics	Stable, forested, undisturbed watershed	Occasional minor disturbances in the watershed, including cattle activity (grazing and/or access to stream), construction, logging, or other minor deforestation. Limited agricultural activities	Frequent disturbances in the watershed, including cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Urbanization over significant portion of watershed	Continual disturbances in the watershed. Significant cattle activity, landslides, channel sand or gravel mining, logging, farming, or construction of buildings, roads, or other infrastructure. Highly urbanized or rapidly urbanizing watershed	7
2. Flow habit	Perennial stream with no flashy behavior	Perennial stream or ephemeral first-order stream with slightly increased rate of flooding	Perennial or intermittent stream with flashy behavior	Extremely flashy; flash floods prevalent mode of discharge; ephemeral stream other than first-order stream	3
3. Channel pattern	No evidence of channelization. Meandering, stable channel or straight (step-pool system, narrow valley), stable channel.	Appears to have previously been channelized. Stream is relatively stable. Channel has some meanders due to previous channel adjustment.	Appears to have previously been channelized. Stream is actively adjusting (meandering); localized areas of instability and/or erosion around bends. Straightened, stable channel.	Appears to have previously been channelized. Stream is actively adjusting (laterally and/or vertically) with few bends. Straight, unstable reach.	8
4. Entrenchment/channel confinement	Active flood plain exists at top of banks; no sign of undercutting infrastructure; no levees	Active flood plain abandoned, but is currently rebuilding; minimal channel confinement; infrastructure not exposed; levees are low and set well back from the river	Moderate confinement in valley or channel walls; some exposure of infrastructure; terraces exist; flood plain abandoned; levees are moderate in size and have minimal setback from the river	Knickpoints visible downstream; exposed water lines or other infrastructure; channel-width-to-top-of-banks ratio small; deeply confined; no active flood plain; levees are high and along the channel edge	7
5. Bed material Fs = approximate portion of sand in the bed	Assorted sized tightly packed, overlapping, and possibly imbricated. Most material > 4 mm. Fs < 20%	Moderately packed with some overlapping. Very small amounts of material < 4 mm. 20 < Fs < 50%	Loose assortment with no apparent overlap. Small to medium amounts of material < 4 mm. 50 < Fs < 70%	Very loose assortment with no packing. Large amounts of material < 4 mm. Fs > 70%	11
6. Bar development	For S < 0.02 and wly > 12, bars are mature, narrow relative to stream width at low flow, well-vegetated, and composed of coarse gravel to cobbles. For S > 0.02 and wly are < 12, no bars are evident	For S < 0.02 and wly > 12, bars may have vegetation and/or be composed of coarse gravel to cobbles, but minimal recent growth of bar evident by lack of vegetation on portions of the bar. For S > 0.02 and wly < 12, no bars are evident	For S < 0.02 and wly > 12, bar widths tend to be wide and composed of newly deposited coarse sand to small cobbles and/or may be sparsely vegetated. Bars forming for S > 0.02 and wly < 12	Bar widths are generally greater than 1/2 the stream width at low flow. Bars are composed of extensive deposits of fine particles up to coarse gravel with little to no vegetation. No bars for S < 0.02 and wly > 12	8
7. Obstructions, including bedrock outcrops, armor layer, LED jams, grade control, bridge bed paving, revetments, dikes or vanes, riprap	Rare or not present	Occasional, causing cross currents and minor bank and bottom erosion	Moderately frequent and occasionally unstable obstructions, cause noticeable erosion of the channel. Considerable sediment accumulation behind obstructions	Frequent and often unstable, causing a continual shift of sediment and flow. Traps are easily filled, causing channel to migrate and/or widen	6

Stability Indicator	Excellent (1 - 3)			Good (4 - 6)			Fair (7 - 9)			Poor (10 - 12)			Score
	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
8. Bank soil texture and coherence	Clay and silty clay, cohesive material	Clay loam to sandy clay loam; minor amounts of noncohesive or unconsolidated mixtures; layers may exist, but are cohesive materials	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
9. Average bank slope angle (where 90° is a vertical bank)	Bank slopes < 3H:1V (18°) for noncohesive or unconsolidated materials to < 1:1 (45°) in clays on both sides	Bank slopes up to 2H:1V (27°) in noncohesive or unconsolidated materials to 0.8:1 (50°) in clays on one or occasionally both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Bank slopes to 1H:1V (45°) in noncohesive or unconsolidated materials to 0.6:1 (60°) in clays common on one or both banks	Sandy clay to sandy loam; unconsolidated mixtures of glacial or other materials; small layers and lenses of noncohesive or unconsolidated mixtures	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
10. Vegetative or engineered bank protection	Wide band of woody vegetation with at least 90% density and cover. Primarily hard wood, leafy, deciduous trees with mature, healthy, and diverse vegetation located on the bank. Woody vegetation oriented vertically. In absence of vegetation, both banks are lined or heavily armored	Medium band of woody vegetation with 70-90% plant density and cover. A majority of hard wood, leafy, deciduous trees with maturing, diverse vegetation located on the bank. Wood vegetation oriented 80-90% from horizontal with minimal root exposure. Partial lining or armoring of one or both banks	Small band of woody vegetation with 50-70% plant density and cover. A majority of soft wood, piney, coniferous trees with young or old vegetation lacking in diversity located on or near the top of bank. Woody vegetation oriented at 70-80% from horizontal, often with evident root exposure. No lining of banks, but some armoring may be in place on one bank	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
11. Bank cutting	Little or none evident. Infrequent raw banks, insignificant percentage of total bank	Some intermittently along channel bends and at prominent constrictions. Raw banks comprise minor portion of bank in vertical direction	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Significant and frequent on both banks. Raw banks comprise large portion of bank in vertical direction. Root mat overhangs	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
12. Mass wasting or bank failure	No or little evidence of potential or very small amounts of mass wasting. Uniform channel width over the entire reach	Evidence of infrequent and/or minor mass wasting. Mostly healed over with vegetation. Relatively constant channel width and minimal scalloping of banks	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Evidence of frequent and/or significant occurrences of mass wasting that can be aggravated by higher flows, which may cause undercutting and mass wasting of unstable banks. Channel width quite irregular, and scalloping of banks is evident	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							
13. Upstream distance to bridge from nearest support pier and alignment	More than 35 m; bridge is well aligned with river flow	20-35 m; bridge is aligned with flow	10-20 m; bridge is skewed to flow; or flow alignment is otherwise not centered beneath bridge	Less than 10 m; bridge is poorly aligned with flow	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels	Loamy sand to sand; noncohesive material; unconsolidated mixtures of glacial or other materials; layers of lenses that include noncohesive sands and gravels							

H = horizontal, V = vertical, Fs = fraction of sand, S = slope, wy = width-to-depth ratio

Total Score

40

90

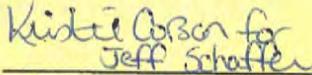
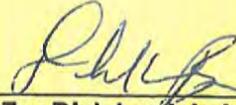
**Appendix 7: Categorical Exclusion with Resource Agency
Correspondence**

IRT Correspondence

Categorical Exclusion Form for Ecosystem Enhancement Program Projects

Version 1.4

Note: Only Appendix A should be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Candy Creek Mitigation Site
County Name:	Gulford County
EEP Number:	96315
Project Sponsor:	Wildlands Engineering, Inc.
Project Contact Name:	Andrea S. Eckardt
Project Contact Address:	1430 S. Mint Street, Suite 104, Charlotte, NC 28203
Project Contact E-mail:	aekardt@wildlandseng.com
EEP Project Manager:	Jeff Schaffer
Project Description	
<p>The Candy Creek Mitigation Site is a stream mitigation project located in Guilford County, NC. The project is located on Candy Creek and nine unnamed tributaries approximately 13 miles northeast of the City of Greensboro. The project will provide stream mitigation units to NCEEP in the Cape Fear River Basin (03030002).</p>	
For Official Use Only	
Reviewed By:	
4-17-14	 EEP Project Manager
Date	
Conditional Approved By:	
Date	For Division Administrator FHWA
<input type="checkbox"/> Check this box if there are outstanding issues	
Final Approval By:	
4-17-14	 For Division Administrator FHWA
Date	

Part 2: All Projects Regulation/Question		Response
Coastal Zone Management Act (CZMA)		
1. Is the project located in a CAMA county?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Has a CAMA permit been secured?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
4. Has NCDPCM agreed that the project is consistent with the NC Coastal Management Program?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)		
1. Is this a "full-delivery" project?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
6. Is there an approved hazardous mitigation plan?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
National Historic Preservation Act (Section 106)		
1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Does the project affect such properties and does the SHPO/THPO concur?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. If the effects are adverse, have they been resolved?		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)		
1. Is this a "full-delivery" project?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Does the project require the acquisition of real estate?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
3. Was the property acquisition completed prior to the intent to use federal funds?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
4. Has the owner of the property been informed: * prior to making an offer that the agency does not have condemnation authority; and * what the fair market value is believed to be?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

Part 3: Ground-Disturbing Activities Regulation/Question		Response
American Indian Religious Freedom Act (AIRFA)		
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
2. Is the site of religious importance to American Indians?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
4. Have the effects of the project on this site been considered?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Antiquities Act (AA)		
1. Is the project located on Federal lands?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
3. Will a permit from the appropriate Federal agency be required?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
4. Has a permit been obtained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Archaeological Resources Protection Act (ARPA)		
1. Is the project located on federal or Indian lands (reservation)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
2. Will there be a loss or destruction of archaeological resources?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
3. Will a permit from the appropriate Federal agency be required?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
4. Has a permit been obtained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Endangered Species Act (ESA)		
1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
2. Is Designated Critical Habitat or suitable habitat present for listed species?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
3. Are T&E species present or is the project being conducted in Designated Critical Habitat?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
4. Is the project "likely to adversely affect" the species and/or "likely to adversely modify" Designated Critical Habitat?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
5. Does the USFWS/NOAA-Fisheries concur in the effects determination?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

Executive Order 13007 (Indian Sacred Sites)	
1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Has the EBCI indicated that Indian sacred sites may be impacted by the proposed project?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Have accommodations been made for access to and ceremonial use of Indian sacred sites?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Farmland Protection Policy Act (FPPA)	
1. Will real estate be acquired?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Has NRCS determined that the project contains prime, unique, statewide or locally important farmland?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
3. Has the completed Form AD-1006 been submitted to NRCS?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Fish and Wildlife Coordination Act (FWCA)	
1. Will the project impound, divert, channel deepen, or otherwise control/modify any water body?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Have the USFWS and the NCWRC been consulted?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Land and Water Conservation Fund Act (Section 6(f))	
1. Will the project require the conversion of such property to a use other than public, outdoor recreation?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Has the NPS approved of the conversion?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)	
1. Is the project located in an estuarine system?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Is suitable habitat present for EFH-protected species?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Is sufficient design information available to make a determination of the effect of the project on EFH?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
4. Will the project adversely affect EFH?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
5. Has consultation with NOAA-Fisheries occurred?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Migratory Bird Treaty Act (MBTA)	
1. Does the USFWS have any recommendations with the project relative to the MBTA?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Have the USFWS recommendations been incorporated?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Wilderness Act	
1. Is the project in a Wilderness area?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Has a special use permit and/or easement been obtained from the maintaining federal agency?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

**Candy Creek Mitigation Site
Categorical Exclusion
Summary**

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment.

As the Candy Creek Mitigation Site is a full-delivery project; an EDR Radius Map Report with Geotcheck was ordered for the site through Environmental Data Resources, Inc on February 26, 2014. Neither the target property nor the adjacent properties were listed in any of the Federal, State, or Tribal environmental databases searched by EDR. There were no known or potential hazardous waste sites identified within or immediately adjacent to the project area. The Executive Summary of the EDR report is included in the Appendix. The full report is available if needed.

National Historic Preservation Act (Section 106)

The National Historic Preservation Act declares a national policy of historic preservation to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and Section 106 mandates that federal agencies take into account the effect of an undertaking on a property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

Wildlands Engineering, Inc. (Wildlands) requested review and comment from the State Historic Preservation Office (SHPO) with respect to any archeological and architectural resources related to the Candy Creek Mitigation Site on February 27, 2014. SHPO responded on March 24, 2014 and stated they were aware of no historic resources that would be affected by the project. All correspondence related to Section 106 is included in the Appendix.

Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)

These acts, collectively known as the Uniform Act, provide for uniform and equitable treatment of persons displaced from their homes, businesses, non-profit associations, or farms by federal and federally-assisted programs, and establish uniform and equitable land acquisition policies.

Candy Creek Mitigation Site is a full-delivery project that includes land acquisition. Notification of the fair market value of the project property and the lack of condemnation authority by Wildlands was included in the signed option agreement for the project property. A copy of the relevant section of the option agreement is included in the Appendix.

Endangered Species Act (ESA)

Section 7 of the ESA requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior or of Commerce, as appropriate, to ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species.

The Guilford County listed endangered species include the bald eagle (*Haliaeetus leucocephalus*) (BGPA) and small whorled pogonia (*Isotria medeoloides*). The USFWS does not currently list any

Critical Habitat Designations for any of the Federally-listed species within Guilford County. Wildlands requested review and comment from the United States Fish and Wildlife Service (USFWS) on February 27, 2014 in respect to the Candy Creek Mitigation Site and its potential impacts on threatened or endangered species. USFWS responded on April 4, 2014 and stated 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”. All correspondence with USFWS is included in the Appendix.

As a result of a pedestrian survey conducted on September 26, 2013, no individual species or critical habitat were found to exist on the site for two species. There was no suitable habitat found for the bald eagle, but there were small areas of suitable habitat found for the small whorled pogonia in some of the forested areas of the project; however additional review of the potential habitat areas found no individual species within the project area. It was determined that the project would result in “no effect” on any of the listed species.

Farmland Protection Policy Act (FPPA)

The FPPA requires that, before taking or approving any federal action that would result in conversion of farmland, the agency must examine the effects of the action using the criteria set forth in the FPPA, and, if there are adverse effects, must consider alternatives to lessen them.

The Candy Creek Mitigation Site includes the conversion of prime farmland. As such, Form AD-1006 has been completed and submitted to the Natural Resources Conservation Service (NRCS). The completed form and correspondence documenting its submittal is included in the Appendix.

Fish and Wildlife Coordination Act (FWCA)

The FWCA requires consultation with the USFWS and the appropriate state wildlife agency on projects that alter or modify a water body. Reports and recommendations prepared by these agencies document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources.

The Candy Creek Mitigation Site includes stream restoration. Wildlands requested comment on the project from both the USFWS and the North Carolina Wildlife Resources Commission (NCWRC) on February 27, 2014. NCWRC responded on March 14, 2014 and stated they “do not anticipate the project to result in significant adverse impacts to aquatic and terrestrial wildlife resources”. The USFWS responded on April 4, 2014 and had no objections to the project. All correspondence with the two agencies is included in the Appendix.

Migratory Bird Treaty Act (MBTA)

The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. The indirect killing of birds by destroying their nests and eggs is covered by the MBTA, so construction in nesting areas during nesting seasons can constitute a taking.

Wildlands requested comment on the Candy Creek Stream Mitigation Site from the USFWS in regards to migratory birds on February 27, 2014. USFWS responded on April 4, 2014, but had no comments regarding migratory birds.. All correspondence with USFWS is included in the Appendix.

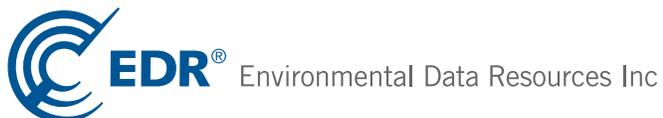
**Candy Creek Mitigation Site
Categorical Exclusion
Appendix**

Candy Creek

5217-5273 HOPKINS RD
Browns Summit, NC 27214

Inquiry Number: 3865904.2s
February 26, 2014

The EDR Radius Map™ Report with GeoCheck®



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
 Please contact EDR at 1-800-352-0050
 with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

5217-5273 HOPKINS RD
BROWNS SUMMIT, NC 27214

COORDINATES

Latitude (North): 36.2338000 - 36° 14' 1.68"
Longitude (West): 79.6615000 - 79° 39' 41.40"
Universal Transverse Mercator: Zone 17
UTM X (Meters): 620284.9
UTM Y (Meters): 4010510.2
Elevation: 750 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 36079-B6 BROWNS SUMMIT, NC
Most Recent Revision: 1994

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year: 2012
Source: USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL..... National Priority List

EXECUTIVE SUMMARY

Proposed NPL..... Proposed National Priority List Sites
NPL LIENS..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL..... National Priority List Deletions

Federal CERCLIS list

CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG..... RCRA - Large Quantity Generators
RCRA-SQG..... RCRA - Small Quantity Generators
RCRA-CESQG..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS..... Engineering Controls Sites List
US INST CONTROL..... Sites with Institutional Controls
LUCIS..... Land Use Control Information System

Federal ERNS list

ERNS..... Emergency Response Notification System

State- and tribal - equivalent NPL

NC HSDS..... Hazardous Substance Disposal Site

State- and tribal - equivalent CERCLIS

SHWS..... Inactive Hazardous Sites Inventory

State and tribal landfill and/or solid waste disposal site lists

SWF/LF..... List of Solid Waste Facilities
OLI..... Old Landfill Inventory

State and tribal leaking storage tank lists

LUST..... Regional UST Database

EXECUTIVE SUMMARY

LUST TRUST..... State Trust Fund Database
LAST..... Leaking Aboveground Storage Tanks
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST..... Petroleum Underground Storage Tank Database
AST..... AST Database
INDIAN UST..... Underground Storage Tanks on Indian Land
FEMA UST..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL..... No Further Action Sites With Land Use Restrictions Monitoring

State and tribal voluntary cleanup sites

VCP..... Responsible Party Voluntary Action Sites
INDIAN VCP..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS..... Brownfields Projects Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9..... Torres Martinez Reservation Illegal Dump Site Locations
ODI..... Open Dump Inventory
HIST LF..... Solid Waste Facility Listing
SWRCY..... Recycling Center Listing
INDIAN ODI..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL..... Clandestine Drug Labs
US HIST CDL..... National Clandestine Laboratory Register

Local Land Records

LIENS 2..... CERCLA Lien Information

Records of Emergency Release Reports

HMIRS..... Hazardous Materials Information Reporting System
IMD..... Incident Management Database
SPILLS 80..... SPILLS 80 data from FirstSearch
SPILLS 90..... SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR..... RCRA - Non Generators

EXECUTIVE SUMMARY

DOT OPS.....	Incident and Accident Data
DOD.....	Department of Defense Sites
FUDS.....	Formerly Used Defense Sites
CONSENT.....	Superfund (CERCLA) Consent Decrees
ROD.....	Records Of Decision
UMTRA.....	Uranium Mill Tailings Sites
US MINES.....	Mines Master Index File
TRIS.....	Toxic Chemical Release Inventory System
TSCA.....	Toxic Substances Control Act
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS.....	Section 7 Tracking Systems
ICIS.....	Integrated Compliance Information System
PADS.....	PCB Activity Database System
MLTS.....	Material Licensing Tracking System
RADINFO.....	Radiation Information Database
FINDS.....	Facility Index System/Facility Registry System
RAATS.....	RCRA Administrative Action Tracking System
RMP.....	Risk Management Plans
UIC.....	Underground Injection Wells Listing
DRYCLEANERS.....	Drycleaning Sites
NPDES.....	NPDES Facility Location Listing
INDIAN RESERV.....	Indian Reservations
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
2020 COR ACTION.....	2020 Corrective Action Program List
LEAD SMELTERS.....	Lead Smelter Sites
US AIRS.....	Aerometric Information Retrieval System Facility Subsystem
PRP.....	Potentially Responsible Parties
COAL ASH DOE.....	Steam-Electric Plant Operation Data
COAL ASH.....	Coal Ash Disposal Sites
US FIN ASSUR.....	Financial Assurance Information
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
Financial Assurance.....	Financial Assurance Information Listing
PCB TRANSFORMER.....	PCB Transformer Registration Database
EPA WATCH LIST.....	EPA WATCH LIST

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat.....	EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners.....	EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST.....	Recovered Government Archive Leaking Underground Storage Tank
RGA LF.....	Recovered Government Archive Solid Waste Facilities List
RGA HWS.....	Recovered Government Archive State Hazardous Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

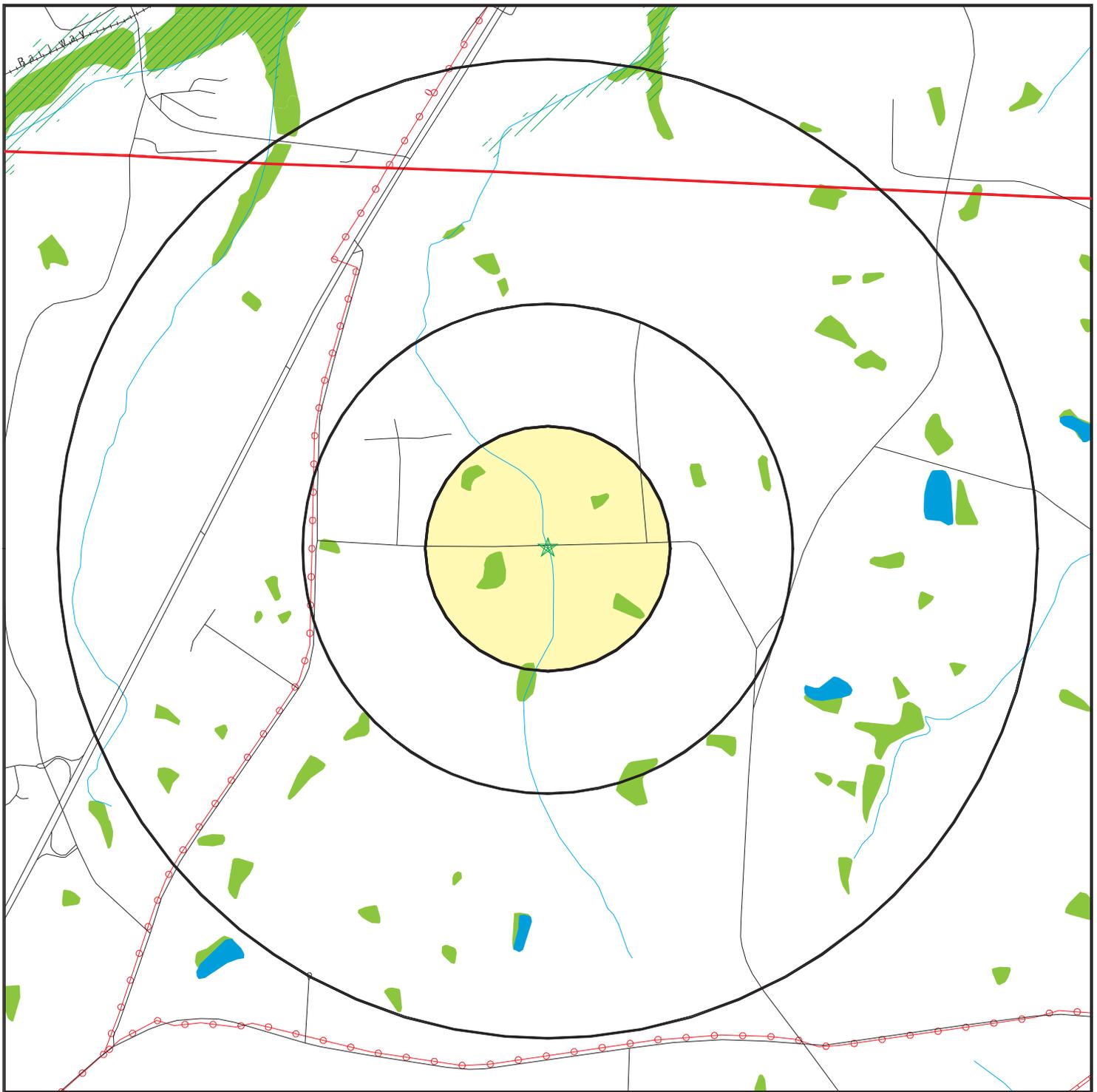
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 24 records.

<u>Site Name</u>	<u>Database(s)</u>
FINISH LINE TRANSPORT	LAST
TRIANGLE RESOURCES INDUSTRIES	CERC-NFRAP, MANIFEST
CORNELL PROPERTY	LUST TRUST
BROWN SUMMIT GROCERY	UST
BROWNS SUMMIT	UST
ANDY'S GROCERY	UST
ADKINS GROCERY	UST
MIDWAY GROC.	UST
RUTH T. CARTER	UST
J.W. MORRICK EXXON	UST
REX COUNTRY STORE	UST
WILSON GROCERY	UST
SSC REIDSVILLE SERVICE	UST
COLLINS GROCERY	UST
PEP-CO SERVICE STATION	UST
COUNCIL ON MENTAL RETARDATION	UST
731ST MAINT. CO (NC NAT'L GUARD)	UST
COACH'S GROCERY	UST
MIDWAY MARKET	UST
G B GREEN & SON INC	UST
WILSON TRUCKING CORP.	UST
G. W. WALKER'S STORE	UST
COMB'S GULF	UST
SMITH CAROLINA CORP	RCRA NonGen / NLR

OVERVIEW MAP - 3865904.2s



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

▲ Manufactured Gas Plants

■ National Priority List Sites

■ Dept. Defense Sites

■ Indian Reservations BIA

— County Boundary

— Power transmission lines

— Oil & Gas pipelines from USGS

■ 100-year flood zone

■ 500-year flood zone

■ National Wetland Inventory

■ State Wetlands

■ Hazardous Substance Disposal Sites

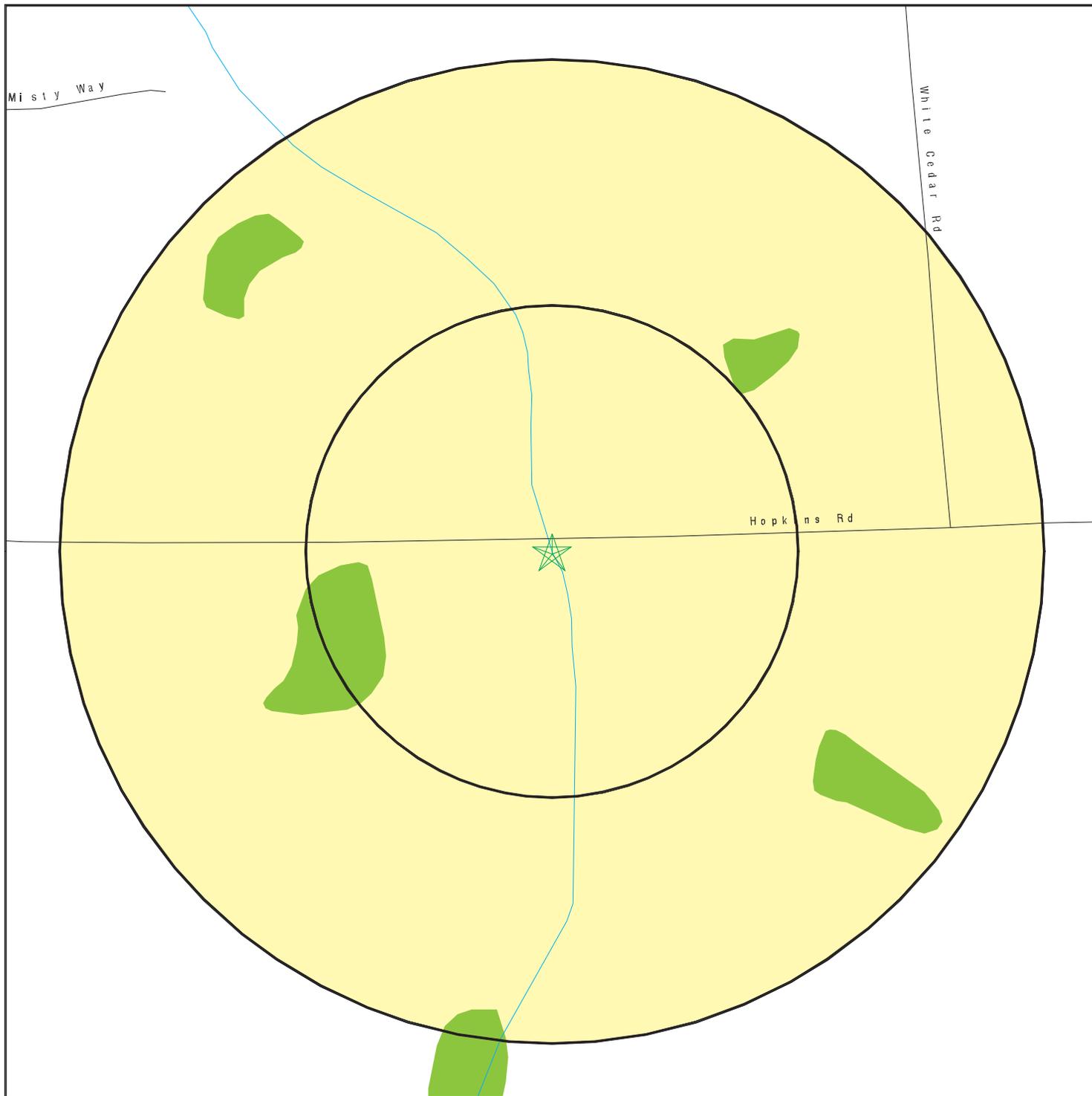


This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Candy Creek
 ADDRESS: 5217-5273 HOPKINS RD
 Browns Summit NC 27214
 LAT/LONG: 36.2338 / 79.6615

CLIENT: Wildlands Eng, Inc.
 CONTACT: Andrea Eckardt
 INQUIRY #: 3865904.2s
 DATE: February 26, 2014 1:24 pm

DETAIL MAP - 3865904.2s



- ★ Target Property
- ▲ Sites at elevations higher than or equal to the target property
- ◆ Sites at elevations lower than the target property
- ▲ Manufactured Gas Plants
- ⚡ Sensitive Receptors
- ☒ National Priority List Sites
- ☒ Dept. Defense Sites

- 0 1/16 1/8 1/4 Miles
- ☒ Indian Reservations BIA
- ⚡ Oil & Gas pipelines from USGS
- ▨ 100-year flood zone
- ▨ 500-year flood zone
- National Wetland Inventory
- State Wetlands
- ☒ Hazardous Substance Disposal Sites

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Candy Creek
 ADDRESS: 5217-5273 HOPKINS RD
 Browns Summit NC 27214
 LAT/LONG: 36.2338 / 79.6615

CLIENT: Wildlands Eng, Inc.
 CONTACT: Andrea Eckardt
 INQUIRY #: 3865904.2s
 DATE: February 26, 2014 1:26 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
<i>Federal NPL site list</i>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
<i>Federal Delisted NPL site list</i>								
Delisted NPL	1.000		0	0	0	0	NR	0
<i>Federal CERCLIS list</i>								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
<i>Federal CERCLIS NFRAP site List</i>								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
<i>Federal RCRA CORRACTS facilities list</i>								
CORRACTS	1.000		0	0	0	0	NR	0
<i>Federal RCRA non-CORRACTS TSD facilities list</i>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<i>Federal RCRA generators list</i>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<i>Federal institutional controls / engineering controls registries</i>								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
<i>Federal ERNS list</i>								
ERNS	TP		NR	NR	NR	NR	NR	0
<i>State- and tribal - equivalent NPL</i>								
NC HSDS	1.000		0	0	0	0	NR	0
<i>State- and tribal - equivalent CERCLIS</i>								
SHWS	1.000		0	0	0	0	NR	0
<i>State and tribal landfill and/or solid waste disposal site lists</i>								
SWF/LF	0.500		0	0	0	NR	NR	0
OLI	0.500		0	0	0	NR	NR	0
<i>State and tribal leaking storage tank lists</i>								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST TRUST	0.500		0	0	0	NR	NR	0
LAST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
<i>State and tribal registered storage tank lists</i>								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
<i>State and tribal institutional control / engineering control registries</i>								
INST CONTROL	0.500		0	0	0	NR	NR	0
<i>State and tribal voluntary cleanup sites</i>								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
<i>State and tribal Brownfields sites</i>								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
<u>ADDITIONAL ENVIRONMENTAL RECORDS</u>								
<i>Local Brownfield lists</i>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<i>Local Lists of Landfill / Solid Waste Disposal Sites</i>								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
<i>Local Lists of Hazardous waste / Contaminated Sites</i>								
US CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
<i>Local Land Records</i>								
LIENS 2	TP		NR	NR	NR	NR	NR	0
<i>Records of Emergency Release Reports</i>								
HMIRS	TP		NR	NR	NR	NR	NR	0
IMD	0.500		0	0	0	NR	NR	0
SPILLS 80	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
<i>Other Ascertainable Records</i>								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST	TP		NR	NR	NR	NR	NR	0
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA HWS	TP		NR	NR	NR	NR	NR	0



February 27, 2014

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Subject: EEP Stream mitigation project in Guilford County, NC
Candy Creek Stream Mitigation Site

Dear Ms. Gledhill-Earley,

The Ecosystem Enhancement Program (EEP) requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with a potential stream restoration project on the attached site (USGS site map and aerial map with approximate areas of potential ground disturbance are enclosed).

The Candy Creek site has been identified for the purpose of providing in-kind mitigation for unavoidable stream channel impacts. Several sections of channel have been identified as significantly degraded. The site has historically been disturbed due agricultural use, including cattle pasture and farmland. There are also forested areas on the site. No architectural structures or archaeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes.

We ask that you review this site based on the attached information to determine the presence of any historic properties.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

A handwritten signature in cursive script that reads "Andrea S. Eckardt".

Andrea S. Eckardt
Senior Environmental Planner
aeckardt@wildlandseng.com



North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

March 24, 2014

Andrea Eckardt
Wildlands Engineering
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Re: Candy Creek Stream Mitigation Site, Guilford County, ER 14-0410

Dear Ms. Eckardt:

Thank you for your letter of February 27, 2014, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

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, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or renee.gledhill-earley@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

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

for Ramona M. Bartos

TO OPTIONOR: Barbara and Dele Aniyikaiye
5305 Misty Way
Browns Summit, NC 27214

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3.11 Entire Agreement. This Agreement (including all exhibits attached hereto) is the final expression of, and contains the entire agreement between, the parties with respect to the subject matter hereof and supersedes all prior understandings with respect thereto. This Agreement may not be modified, changed, supplemented, superseded, canceled or terminated, nor may any obligations hereunder be waived, except by written instrument signed by the party to be charged or by its agent duly authorized in writing or as otherwise expressly permitted herein. Notwithstanding any rule or maxim of construction to the contrary, any ambiguity or uncertainty shall not be construed against either Optionor or Optionee based upon authorship of any of the provisions hereof.

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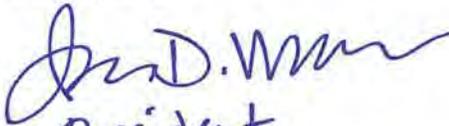
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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the dates set forth below.

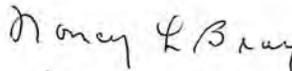
OPTIONEE:

WILDLANDS ENGINEERING, INC., a North Carolina corporation

By: 
Its: **President**
Date: **10/15/2013**

OPTIONOR:

Nancy Bray

By: 
Date: **10-16-2013**

LIST OF EXHIBITS

Exhibit A	-	Exhibit of Conservation Area
Exhibit B	-	Conservation Easement
Exhibit C	-	Memorandum of Agreement

ARTICLE 3

MISCELLANEOUS

3.1 Liquidated Damages. Optionee recognizes that the Property will be removed by Optionor from the market during the existence of this agreement. If the purchase of the Conservation Easement is not consummated because of Optionee's default, the parties have determined and agreed that the actual amount of damages that would be suffered by Optionor as a result of any such default would be very difficult or impracticable to determine as of the date of this Agreement. As a result, the parties have agreed that the Option Consideration paid by Optionee to Optionor as of the date of Optionee's default is sufficient to cover any estimated damages that may be incurred by Optionor. For these reasons, the parties agree that if the purchase of the Conservation Easement is not consummated because of Optionee's default, Optionor shall be entitled to retain the Option Consideration paid by Optionee as of the date of Optionee's default as its sole remedy, and Optionor waives any and all right to seek other rights or remedies against Optionee, including without limitation, specific performance. Nothing set forth in this section 3.1 shall preclude any action under any indemnification, defense or hold harmless provision in this Agreement, nor for the award of attorney's fees and costs in conjunction with any action relating to this Agreement.

3.2 Notices. All notices required to or permitted to be given pursuant to this Agreement shall be in writing, shall be given only in accordance with the provisions of this Section, shall be addressed to the parties in the manner set forth below, and shall be conclusively deemed to have been properly delivered: (a) upon receipt when hand delivered during normal business hours; (b) upon receipt when sent by facsimile prior to 5:00 p.m. of a given business day; provided, however, that notices given by facsimile shall not be effective unless the sending party's machine provides written confirmation of successful delivery thereof; (c) upon the day of delivery if the notice has been deposited in a authorized receptacle of the United States Postal Service as first-class, registered or certified mail, postage prepaid, with a return receipt requested; or (d) one (1) business day after the notice has been deposited with either FedEx or United Parcel Service to be delivered by overnight delivery. The addresses of the parties to receive notices are as follows:

TO OPTIONEE: Wildlands Engineering, Inc.
1430 S. Mint Street, Suite 104
Charlotte, North Carolina 28203
Attention: Robert W. Bugg
eMail: rbugg@wildlandseng.com
Facsimile: (704) 332-3306

TO OPTIONOR: Darin Carr
7543 Friendship Church Road
Brown Summit, NC 27214

Notice of change of address shall be given by written notice in the manner described in this Paragraph.

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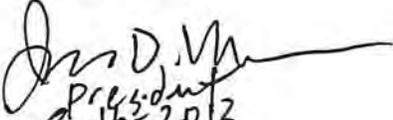
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OPTIONEE:

WILDLANDS ENGINEERING, INC., a North Carolina corporation

By: 
Its: *President*
8-16-2013
Date:

OPTIONOR:

Bruce H. and Margie L. Chrismon

By: 
Date: *8-6-2013*
By: *Margie L. Chrismon*
Date: *8-6-13*

LIST OF EXHIBITS

- | | | |
|-----------|---|------------------------------|
| Exhibit A | - | Exhibit of Conservation Area |
| Exhibit B | - | Conservation Easement |
| Exhibit C | - | Memorandum of Agreement |
| Exhibit D | - | Fencing Specifications |

TO OPTIONOR:

Bruce Chrismon
5245 Hopkins Road
Browns Summit, NC 27214

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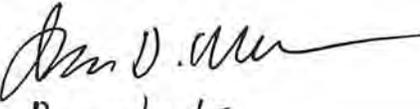
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By: 
Its: *President*
Date: *8-16-2013*

OPTIONOR:

Elmo Chrismon

By: 
Date: *8-6-13*

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eMail: rbugg@wildlandseng.com

Facsimile: (704) 332-3306

TO OPTIONOR:

Bryan Hopkins
1628 Ardsley Street
Winston Salem NC
27103

bd hops@yahoo.com

BM

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default, Optionor shall be entitled to retain the Option Consideration paid by Optionee as of the date of Optionee's default as its sole remedy, and Optionor waives any and all right to seek other rights or remedies against Optionee, including without limitation, specific performance. Nothing set forth in this section 3.1 shall preclude any action under any indemnification, defense or hold harmless provision in this Agreement, nor for the award of attorney's fees and costs in conjunction with any action relating to this Agreement.

3.2 Notices. All notices required to or permitted to be given pursuant to this Agreement shall be in writing, shall be given only in accordance with the provisions of this Section, shall be addressed to the parties in the manner set forth below, and shall be conclusively deemed to have been properly delivered: (a) upon receipt when hand delivered during normal business hours; (b) upon receipt when sent by facsimile prior to 5:00 p.m. of a given business day; provided, however, that notices given by facsimile shall not be effective unless the sending party's machine provides written confirmation of successful delivery thereof; (c) upon the day of delivery if the notice has been deposited in a authorized receptacle of the United States Postal Service as first-class, registered or certified mail, postage prepaid, with a return receipt requested; or (d) one (1) business day after the notice has been deposited with either FedEx or United Parcel Service to be delivered by overnight delivery. The addresses of the parties to receive notices are as follows:

TO OPTIONEE: Wildlands Engineering, Inc.
1430 S. Mint Street, Suite 104
Charlotte, North Carolina 28203
Attention: Robert W. Bugg
eMail: rbugg@wildlandseng.com

TO OPTIONOR: Jeff and Mary Ann Hopkins
5315 Hopkins Road
Browns Summit, NC 27214
eMail: mahpk4@aol.com

Notice of change of address shall be given by written notice in the manner described in this Paragraph.

3.3 Assignment. Optionee shall have the right to assign this Agreement without the consent of Optionor. No assignment shall be effective, however, unless the assignee has delivered to Optionor a written assumption of Optionee's obligations under this Agreement. Optionor hereby releases Optionee from any obligations under this Agreement arising after the effective date of any assignment of this Agreement by Optionee.

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3.5 Value of Conservation Easement; No Power of Eminent Domain. in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Optionee hereby notifies Optionor that: (i) Optionee believes that the fair market value of the Conservation Easement is an amount equal to the Purchase Price; and (ii) Optionee does not have the power of eminent domain.

3.6 Waivers. No waiver of any breach of any covenant or provision herein contained shall be deemed a waiver of any preceding or succeeding breach thereof, or of any other covenant or provision herein contained.

3.7 Survival of Obligations. Notwithstanding any provision of this Agreement, the covenants, representations, warranties, hold harmless, defense and indemnification obligations made by each party herein shall survive the Closing.

3.8 Successors and Assigns. This Agreement shall be binding upon and shall inure to the benefit of the successors and assigns of the parties hereto.

3.9 Attorneys' Fees. If either party commences an action against the other to interpret or enforce any of the terms of this Agreement or because of the breach by the other party of any of the terms hereof, the losing party shall pay to the prevailing party reasonable attorneys' fees, costs and expenses and court costs and other costs of action incurred in connection with the prosecution or defense of such action, whether or not the action is prosecuted to a final judgment.

ARTICLE 3

MISCELLANEOUS

3.1 Liquidated Damages. Optionee recognizes that the Property will be removed by Optionor from the market during the existence of this agreement. If the purchase of the Conservation Easement is not consummated because of Optionee's default, the parties have determined and agreed that the actual amount of damages that would be suffered by Optionor as a result of any such default would be very difficult or impracticable to determine as of the date of this Agreement. As a result, the parties have agreed that the Option Consideration paid by Optionee to Optionor as of the date of Optionee's default is sufficient to cover any estimated damages that may be incurred by Optionor. For these reasons, the parties agree that if the purchase of the Conservation Easement is not consummated because of Optionee's default, Optionor shall be entitled to retain the Option Consideration paid by Optionee as of the date of Optionee's default as its sole remedy, and Optionor waives any and all right to seek other rights or remedies against Optionee, including without limitation, specific performance. Nothing set forth in this section 3.1 shall preclude any action under any indemnification, defense or hold harmless provision in this Agreement, nor for the award of attorney's fees and costs in conjunction with any action relating to this Agreement.

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TO OPTIONEE: Wildlands Engineering, Inc.
1430 S. Mint Street, Suite 104
Charlotte, North Carolina 28203
Attention: Robert W. Bugg
eMail: rbugg@wildlandseng.com
Facsimile: (704) 332-3306

TO OPTIONOR: Wallace Hopkins
8076 Old Reidsville Road
Brown Summit, NC 27214

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Attention: Robert W. Bugg
eMail: rbugg@wildlandseng.com
Facsimile: (704) 332-3306

TO OPTIONOR: Joe Hopkins
7575 Friendship Church Road
Browns Summit, NC 27214

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3.9 Attorneys' Fees. If either party commences an action against the other to interpret or enforce any of the terms of this Agreement or because of the breach by the other party of any of the terms hereof, the losing party shall pay to the prevailing party reasonable attorneys' fees, costs and expenses and court costs and other costs of action incurred in connection with the prosecution or defense of such action, whether or not the action is prosecuted to a final judgment.

3.10 Memorandum of Option. Concurrently with the execution of this Agreement, Optionee and Optionor agree to execute, acknowledge and record a "**Memorandum of Agreement**," which shall be in the form attached hereto as Exhibit C. Optionor and Optionee shall record the Memorandum of Agreement against the Property in the Official Records of Guilford County within five (5) days after the Effective Date of this Agreement.

3.11 Entire Agreement. This Agreement (including all exhibits attached hereto) is the final expression of, and contains the entire agreement between, the parties with respect to the subject matter hereof and supersedes all prior understandings with respect thereto. This Agreement may not be modified, changed, supplemented, superseded, canceled or terminated, nor may any obligations hereunder be waived, except by written instrument signed by the party to be charged or by its agent duly authorized in writing or as otherwise expressly permitted herein. Notwithstanding any rule or maxim of construction to the contrary, any ambiguity or uncertainty shall not be construed against either Optionor or Optionee based upon authorship of any of the provisions hereof.

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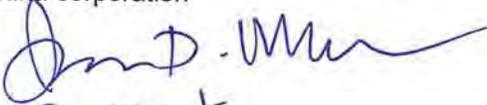
3.14 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which, together, shall constitute one and the same instrument.

3.15 Recitals/Exhibits. The Recitals set forth in this Agreement and the exhibits referenced herein are incorporated herein by this reference.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the dates set forth below.

OPTIONEE:

WILDLANDS ENGINEERING, INC., a North Carolina corporation

By: 
Its: *President*
Date: *10/8/2013*

OPTIONOR:

By: 
Date: *10/10/13*
By:
Date:

LIST OF EXHIBITS

- Exhibit A - Exhibit of Conservation Area
- Exhibit B - Conservation Easement
- Exhibit C - Memorandum of Agreement

TO OPTIONOR:

David Wagoner
3709 April Lane
Greensboro, NC 27405
dwagoner@triad.rr.com

336) 621-4387
m) 336) 580-5883

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February 27, 2014

Dale Suiter
US Fish and Wildlife Service
Raleigh Field Office
PO Box 33726
Raleigh, NC 27636

**Subject: Candy Creek Stream Mitigation Site
Guilford County, North Carolina**

Dear Mr. Suiter,

The Candy Creek Stream Mitigation Site has been identified for the purpose of providing in-kind mitigation for unavoidable stream channel impacts. Several sections of stream channels throughout the site have been identified as significantly degraded as a result of agricultural activities, including its use as a cattle pasture and farmland. There are areas that are forested as well.

We have already obtained an updated species list for Guilford County from your web site (http://www.fws.gov/raleigh/species/cntylist/nc_counties.html). The threatened or endangered species for this county are: the bald eagle (*Haliaeetus leucocephalus*) (BGPA) and small whorled pogonia (*Isotria medeoloides*). We are requesting that you please provide any known information for each species in the county. The USFWS will be contacted if suitable habitat for any listed species is found or if we determine that the project may affect one or more federally listed species or designated critical habitat.

Please provide comments on any possible issues that might emerge with respect to endangered species, migratory birds or other trust resources from the construction of a stream restoration project on the subject property. A USGS map showing the approximate area of potential ground disturbance is enclosed. The figure was prepared from the Browns Summit, 7.5-Minute USGS Topographic Quadrangle. An aerial map is also attached.

If we have not heard from you in 30 days we will assume that you do not have any comments regarding associated laws and that you do not have any information relevant to this project at the current time.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

A handwritten signature in black ink that reads "Andrea S. Eckardt".

Andrea S. Eckardt
Senior Environmental Planner



United States Department of the Interior

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

April 4, 2014

Andrea Eckardt
Wildlands Engineering
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Re: Candy Creek Stream Mitigation Site - Guilford County, NC

Dear Ms. Eckardt:

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 and 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 Kathy Matthews of this office at (919) 856-4520 ext. 27.

Sincerely,

Kathy H. Matthews
for Pete Benjamin
Field Supervisor

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request 2/26/2014				
Name of Project Candy CreekStream Mitigation Site		Federal Agency Involved FHWA - NCEEP				
Proposed Land Use Stream Restoration		County and State County, North Carolina				
PART II (To be completed by NRCS)		Date Request Received By NRCS 02/26/2014		Person Completing Form: Milton Cortes		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input checked="" type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated N/A	Average Farm Size 100 acres	
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 79 % 331, 434 acres		Amount of Farmland As Defined in FPPA Acres: 79 % 331,434 acres			
Name of Land Evaluation System Used Guildford Co, NC LESA	Name of State or Local Site Assessment System N/A		Date Land Evaluation Returned by NRCS 02/28/2014			
PART III (To be completed by Federal Agency)		Alternative Site Rating				
		Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly		56.20				
B. Total Acres To Be Converted Indirectly						
C. Total Acres In Site		56.20				
PART IV (To be completed by NRCS) Land Evaluation Information						
A. Total Acres Prime And Unique Farmland		24.20				
B. Total Acres Statewide Important or Local Important Farmland		27.30				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.0155				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		32%				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)		78				
PART VI (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use		(15)	30			
2. Perimeter In Non-urban Use		(10)	9			
3. Percent Of Site Being Farmed		(20)	5			
4. Protection Provided By State and Local Government		(20)	20			
5. Distance From Urban Built-up Area		(15)	8			
6. Distance To Urban Support Services		(15)	0			
7. Size Of Present Farm Unit Compared To Average		(10)	5			
8. Creation Of Non-farmable Farmland		(10)	0			
9. Availability Of Farm Support Services		(5)	5			
10. On-Farm Investments		(20)	0			
11. Effects Of Conversion On Farm Support Services		(10)	0			
12. Compatibility With Existing Agricultural Use		(10)	0			
TOTAL SITE ASSESSMENT POINTS		160	82	0	0	0
PART VII (To be completed by Federal Agency)						
Relative Value Of Farmland (From Part V)		100	78	0	0	0
Total Site Assessment (From Part VI above or local site assessment)		160	82	0	0	0
TOTAL POINTS (Total of above 2 lines)		260	160	0	0	0
Site Selected:		Date Of Selection		Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>		
Reason For Selection:						
Name of Federal agency representative completing this form:					Date:	

Andrea Eckardt

From: Andrea Eckardt
Sent: Monday, March 24, 2014 10:39 AM
To: 'Cortes, Milton - NRCS, Raleigh, NC'
Subject: RE: Completed AD1006 for Candy Creek, Holman Mill and Maney Projects
Attachments: Maney AD1006_completed_NRCS-signed.pdf; Candy_Creek_AD1006_Completed_by_NRCS-signed.pdf; Holman Mill AD1006_Completed_by_NRCS-signed.pdf

Sensitivity: Confidential

Milton-

Attached are the final AD1006 forms for Candy Creek, Holman Mill and Maney Farms Mitigation Sites for your files. I have completed Parts 6 and 7.

Thanks so much for your help.

Andrea

Andrea S. Eckardt
Wildlands Engineering, Inc.
704-332-7754 ext 101

From: Cortes, Milton - NRCS, Raleigh, NC [mailto:Milton.Cortes@nc.usda.gov]
Sent: Friday, February 28, 2014 4:08 PM
To: Andrea Eckardt
Subject: RE: Completed AD1006 for Candy Creek, Holman Mill and Maney Projects
Importance: High
Sensitivity: Confidential

Hi Andrea;

Attached requested AD1006 for the mentioned projects. If you have any question, please let me know.

You have a great weekend.

Milton Cortés

Assistant State Soil Scientist/
NC NRCS Hispanic Special Emphasis Program Manager



Natural Resources Conservation Service

4407 Bland Rd., Suite 117

Raleigh, NC 27609



(919) 873-2171 / Fax (919) 873-2157

milton.cortes@nc.usda.gov

Helping People Help the Land...

This electronic message contains information generated by the USDA solely for the intended recipients. Any unauthorized interception of this message or the use or disclosure of the information it contains may violate the



February 27, 2014

Shannon Deaton
North Carolina Wildlife Resource Commission
Division of Inland Fisheries
1721 Mail Service Center
Raleigh, NC 27699

**Subject: Candy Creek Stream Mitigation Site
Guilford County, North Carolina**

Dear Ms. Deaton,

The purpose of this letter is to request review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with a potential stream restoration project on the attached site. A USGS map and an aerial map showing the approximate area of potential ground disturbance are enclosed. The topographic figure was prepared from the Browns Summit, 7.5-Minute USGS Topographic Quadrangles.

The Candy Creek Stream Mitigation Site has been identified for the purpose of providing in-kind mitigation for unavoidable stream channel impacts. There are several stream channels located on the site that have been identified as significantly degraded due to past agricultural activities including cattle pasture and farmland. There are forested areas on the site as well.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

A handwritten signature in black ink that reads "Andrea S. Eckardt".

Andrea S. Eckardt
Senior Environmental Planner

Attachment:
USGS Topographic Map
Aerial Map



☒ North Carolina Wildlife Resources Commission ☒

Gordon Myers, Executive Director

14 March 2014

Andrea Eckardt, Senior Environmental Planner
Wildlands Engineering
1430 South Mint Street, Suite 104
Charlotte, North Carolina 28203

Subject: Candy Creek Stream Mitigation Site, Guilford County

Dear Ms. Eckardt:

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the subject information. 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.).

The proposed project would provide in-kind mitigation for unavoidable stream impacts. Several stream channels have been identified as significantly degraded due to past agricultural activities including use as a cattle pasture and farmland. The project site includes unnamed tributaries to Candy Creek in the Cape Fear River basin. The Significant Natural Heritage Area – Troublesome Creek/Benaja Creek Wetlands and Slopes – is located downstream of the site.

According to the information provided, there are forested areas on the site. In general, we recommend maintaining forested riparian areas to the maximum extent practicable during any restoration/construction activities. Stream restoration projects often improve water quality and aquatic habitat. Establishing native, forested buffers in riparian areas will help protect water quality, improve aquatic and terrestrial habitats, and provide a travel corridor for wildlife species. Provided measures are taken to minimize erosion and sedimentation from construction/restoration activities and impacts to existing forested riparian areas are minimized, we do not anticipate the project to result in significant adverse impacts to aquatic and terrestrial wildlife resources.

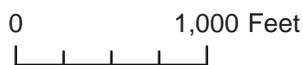
Thank you for the opportunity to review this proposed project. If we can provide further assistance, please contact our office at (336) 449-7625 or shari.bryant@ncwildlife.org.

Sincerely,

A handwritten signature in cursive script that reads "Shari L. Bryant".

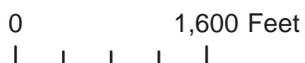
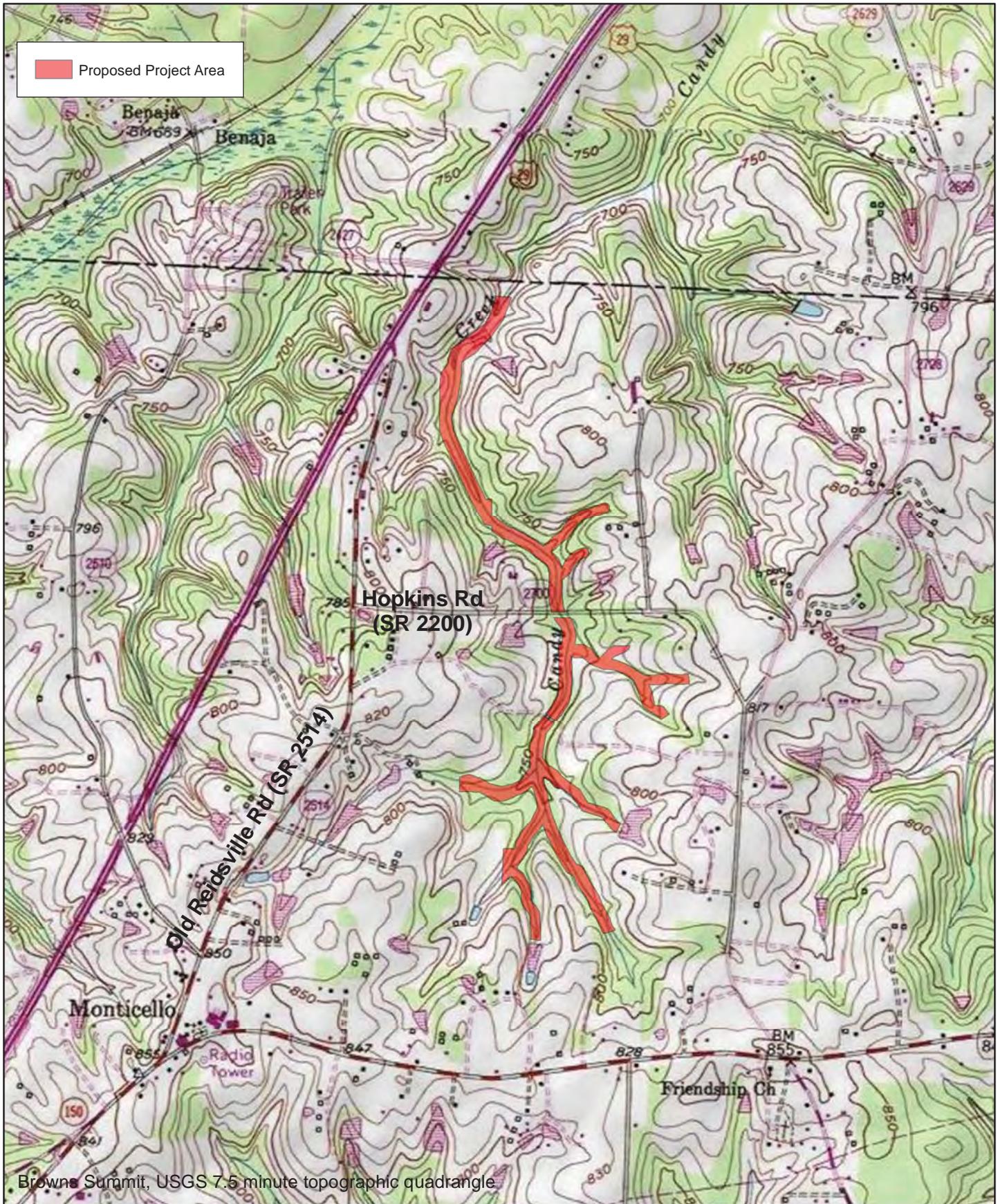
Shari L. Bryant
Piedmont Region Coordinator
Habitat Conservation Program

**Candy Creek Mitigation Site
Categorical Exclusion
Figures**



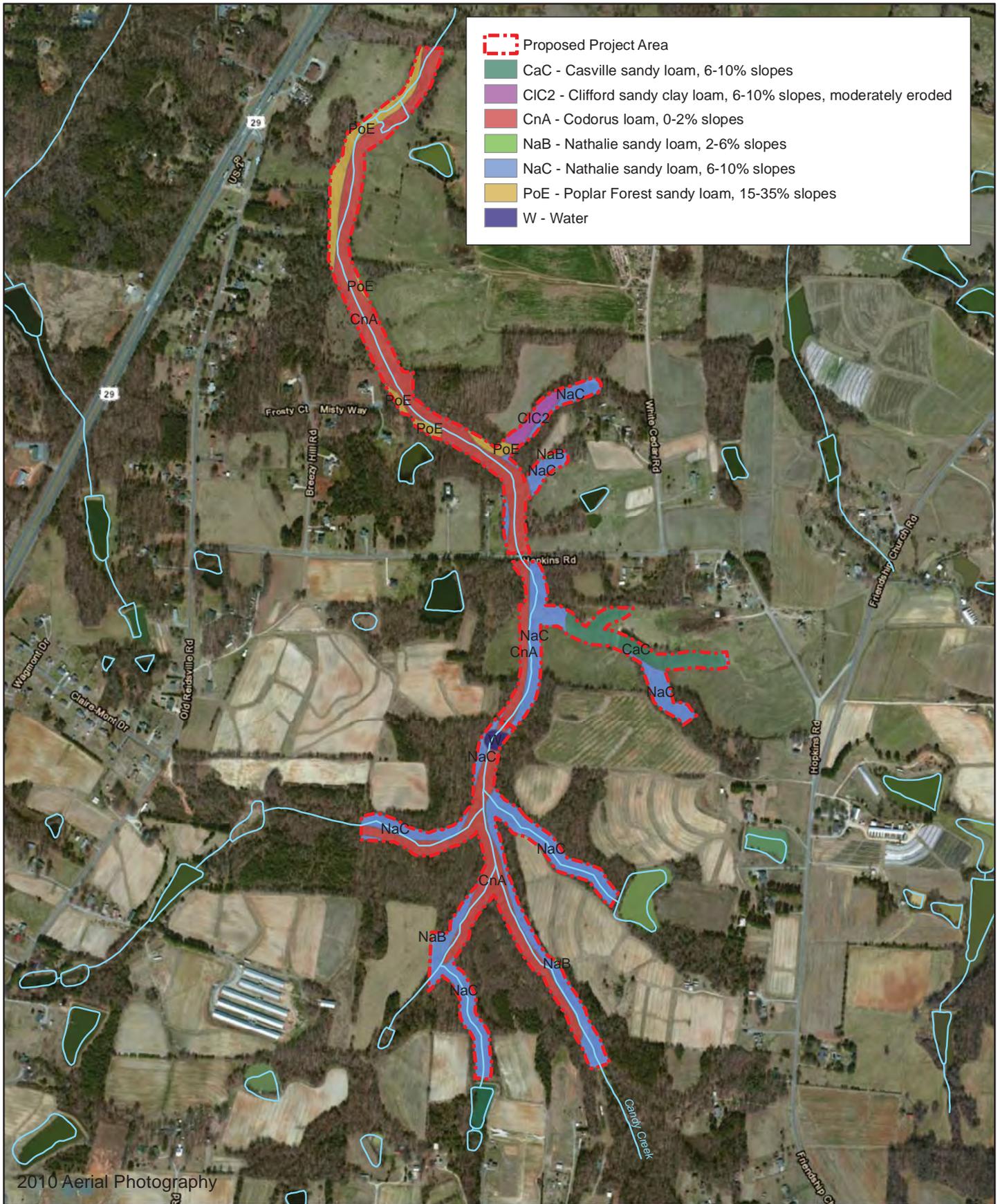
Site Map
Candy Creek Stream Mitigation Site
Cape Fear River Basin (03030002)

Guilford County

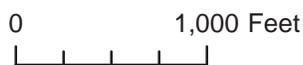


USGS Topographic Map
Candy Creek Stream Mitigation Site
Cape Fear River Basin (03030002)

Guilford County



	Proposed Project Area
	CaC - Casville sandy loam, 6-10% slopes
	CIC2 - Clifford sandy clay loam, 6-10% slopes, moderately eroded
	CnA - Codorus loam, 0-2% slopes
	NaB - Nathalie sandy loam, 2-6% slopes
	NaC - Nathalie sandy loam, 6-10% slopes
	PoE - Poplar Forest sandy loam, 15-35% slopes
	W - Water



Soils Map
 Candy Creek Stream Mitigation Site
 Cape Fear River Basin (03030002)

Guilford County

**Appendix 8: Project Site NCDWQ Stream Classification Forms &
USACE Stream Quality Assessment Worksheets**

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Candy Creek	Latitude: 36.244124°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.664148°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 45	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCI - Candy Creek e.g. Quad Name: Downstream Ends

A. Geomorphology (Subtotal = 24)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	2	(3)
7. Recent alluvial deposits	0	1	2	(3)
8. Headcuts	(0)	1	2	(3)
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

B. Hydrology (Subtotal = 11.5)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5		Other = 0	

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Candy Creek	Latitude: 36.224427°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.660202°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 40.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCP 2 - Candy Creek e.g. Quad Name: Upstream End

A. Geomorphology (Subtotal = 21)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/26/13	Project/Site: Candy Creek	Latitude: 36.237168°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.660422°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	35	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>
		Other SCP 3 - UTIC e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 8.5)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 8' headcut w/ groundwater seepage at top of reach

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/26/13	Project/Site: Candy Creek	Latitude: 36.235573°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.661224°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 27.5	Stream Determination (circle one) Ephemeral/ <u>Intermittent</u> / Perennial	Other SCP4-UTID e.g. Quad Name: below dam

A. Geomorphology (Subtotal = 11)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5		Other = 0	

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/26/13	Project/Site: Candy Creek	Latitude: 36.235844°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.660792°W
Total Points: 24 <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i>	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other SCP 5-UT10 e.g. Quad Name: Above dam

A. Geomorphology (Subtotal = 8.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Candy Creek	Latitude: 36.232701° N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.660434° W
Total Points: 34.5 <small>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</small>	Stream Determination (circle one) Ephemeral Intermittent <input type="checkbox"/> Perennial <input checked="" type="checkbox"/>	Other SCA 6 - UT2 e.g. Quad Name: (Below Pond)

A. Geomorphology (Subtotal = 16.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	1	2	3
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	0	0.5	1	1.5
		No = 0	Yes = 3	

^aartificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	0	1	2	3
15. Sediment on plants or debris	1.5	1	0.5	0
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	0	0.5	1	1.5
		No = 0	Yes = 3	

C. Biology (Subtotal = 10)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	0	0.5	1	1.5
		FACW = 0.75; OBL = 1.5	Other = 0	

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: <u>9/27/13</u>	Project/Site: <u>Candy Creek</u>	Latitude: <u>36.230645° N</u>
Evaluator: <u>I. Eckardt</u>	County: <u>Guilford</u>	Longitude: <u>79.657421° W</u>
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$ <u>32</u>	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other <u>SCP 7-UT2</u> e.g. Quad Name: <u>Above Pond</u>

A. Geomorphology (Subtotal = 16.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	<u>3</u>
2. Sinuosity of channel along thalweg	0	1	<u>2</u>	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	<u>2</u>	3
4. Particle size of stream substrate	0	1	2	<u>3</u>
5. Active/relict floodplain	0	<u>1</u>	2	3
6. Depositional bars or benches	0	<u>1</u>	2	3
7. Recent alluvial deposits	<u>0</u>	1	2	3
8. Headcuts	0	1	2	<u>3</u>
9. Grade control	0	<u>0.5</u>	1	1.5
10. Natural valley	0	0.5	<u>1</u>	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)

12. Presence of Baseflow	0	1	2	<u>3</u>
13. Iron oxidizing bacteria	<u>0</u>	1	2	3
14. Leaf litter	1.5	1	<u>0.5</u>	0
15. Sediment on plants or debris	0	<u>0.5</u>	1	1.5
16. Organic debris lines or piles	0	<u>0.5</u>	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 8)

18. Fibrous roots in streambed	<u>3</u>	2	1	0
19. Rooted upland plants in streambed	<u>3</u>	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	<u>1</u>	2	3
21. Aquatic Mollusks	<u>0</u>	1	2	3
22. Fish	<u>0</u>	0.5	1	1.5
23. Crayfish	<u>0</u>	0.5	1	1.5
24. Amphibians	0	0.5	<u>1</u>	1.5
25. Algae	<u>0</u>	0.5	1	1.5
26. Wetland plants in streambed	0	0.5	1	1.5

FACW = 0.75; OBL = 1.5 Other = 0

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/14	Project/Site: Candy Creek	Latitude: 36.231997°N
Evaluator: J. Eckardt	County: Guilford	Longitude: -79.657830°W
Total Points: 31.5 <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i>	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCP 8A- UT2B e.g. Quad Name: up to bedrock knickpoint

A. Geomorphology (Subtotal = 15)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/14	Project/Site: Candy Creek	Latitude: 36.231798°N
Evaluator: J. Eckardt	County: Guilford	Longitude: -79.656364°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 24.5	Stream Determination (circle one) Ephemeral <u>Intermittent</u> Perennial	Other SCP 8B-UT2B e.g. Quad Name: above bridge up to headcut

A. Geomorphology (Subtotal = 11.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)

12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/14	Project/Site: Candy	Latitude: 36.232582°N
Evaluator: J Eckardt	County: Guilford	Longitude: -79.659527°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 31.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other UT 2A - below e.g. Quad Name: headcut SCP9A

A. Geomorphology (Subtotal = 14.5)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^aartificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 8.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/2014	Project/Site: Candy Creek	Latitude: 36.232904°N
Evaluator: KB	County: Guilford	Longitude: -79.659062°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other UTJA - Above e.g. Quad Name: headcut

SCP9B

A. Geomorphology (Subtotal = 10)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 2 cadisfly larvae

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Candy Creek	Latitude: 36.228766° N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.662042° W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 36.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCP ID - e.g. Quad Name: UT3 - D/S below

old pool basin (Restoration Reach)

A. Geomorphology (Subtotal = 18)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Hydropsychid nets / damselfly / additional unknown benthic
1 fish

NC DWQ Stream Identification Form Version 4.11

Date: 9-27-13	Project/Site: Candy Creek	Latitude: 36.227160°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.659477°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 33.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCP 11-UT3 e.g. Quad Name: Preservation Reach

A. Geomorphology (Subtotal = 15)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	1	2	3
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	0	0.5	1	1.5
		No = 0	Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.5)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	0	0.5	1	1.5
		FACW = 0.75; OBL = 1.5	Other = 0	

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Candy Creek	Latitude: 36.227970°N
Evaluator: JJE	County: Guilford	Longitude: -79.664847°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 37.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other SCP 12- e.g. Quad Name: UTM in preservation

A. Geomorphology (Subtotal = 18)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

^aartificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 11)

18. Fibrous roots in streambed	(2)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	0	0.5	(1)	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: Seep/side floodplain wetland channels just above transition to preservation
Cright

NC DWQ Stream Identification Form Version 4.11

Date: 9-27-13	Project/Site: Candy Creek	Latitude: 36.224472°N
Evaluator: I. Eckardt	County: Guilford	Longitude: -79.664474°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 31.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other SCP 13-UT5 e.g. Quad Name: Above UT5A

A. Geomorphology (Subtotal = 15.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

^aartificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 8)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	0	(0.5)	1	1.5

FACW = 0.75; OBL = 1.5 Other = 0

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 9/27/13	Project/Site: Carly Crk	Latitude: 36.223578° N
Evaluator: I. Eckardt	County: Guilford	Longitude: 79.662385° W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 33.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other SCP 14A - e.g. Quad Name: UTS A - below dam ≈ 500

A. Geomorphology (Subtotal = 16.5)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain incised	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: Pond above reach.
 Channel moderately incised in sections.
 Baseflow goes subsurface in a few areas where roots/dike grade control is holding back surf. H₂O flows down thru sandy deposits.

NC DWQ Stream Identification Form Version 4.11

Date: 8/15/2014	Project/Site: Candy	Latitude: 36.223233°N
Evaluator: KB	County: Guilford	Longitude: -79.662274°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$	Stream Determination (circle one) Ephemeral () Intermittent () Perennial ()	Other UTSA - Above e.g. Quad Name: headcut

SCP 14B

A. Geomorphology (Subtotal = 6.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)

12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 1 Amphibian

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/13/2014	Project/Site: Candy Creek	Latitude: 36.242047°N
Evaluator: KB	County: Guilford	Longitude: -79.666005°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 27.5	Stream Determination (circle one) Ephemeral <u>Intermittent</u> Perennial	Other e.g. Quad Name: S1-SCP15

A. Geomorphology (Subtotal = 13)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	(No = 0)		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 6.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/13/2014	Project/Site: Candy Creek	Latitude: 36.241539°N
Evaluator: KB	County: Guilford	Longitude: -79.665876°W
Total Points: <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i> 26	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other 52-SCP16 e.g. Quad Name:

A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)	Absent	Weak	Moderate	Strong
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6.5)	Absent	Weak	Moderate	Strong
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/13/2014	Project/Site: Candy Creek	Latitude: 36.240385°N
Evaluator: KCB	County: Guilford	Longitude: -79.666480°W
Total Points: <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i> 30	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other <u>S3 - SCP17</u> e.g. Quad Name: 3

A. Geomorphology (Subtotal = <u>13.5</u>)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	<u>2</u>	3
2. Sinuosity of channel along thalweg	0	1	<u>2</u>	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	<u>3</u>
4. Particle size of stream substrate	0	1	<u>2</u>	3
5. Active/relict floodplain	0	1	<u>2</u>	3
6. Depositional bars or benches	<u>0</u>	1	2	3
7. Recent alluvial deposits	0	<u>1</u>	2	3
8. Headcuts	0	<u>1</u>	2	3
9. Grade control	<u>0</u>	0.5	1	1.5
10. Natural valley	0	<u>0.5</u>	1	1.5
11. Second or greater order channel	<u>No = 0</u>		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = <u>9</u>)	Absent	Weak	Moderate	Strong
12. Presence of Baseflow	0	1	2	<u>3</u>
13. Iron oxidizing bacteria	<u>0</u>	1	2	3
14. Leaf litter	<u>1.5</u>	1	0.5	0
15. Sediment on plants or debris	0	0.5	<u>1</u>	1.5
16. Organic debris lines or piles	0	<u>0.5</u>	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = <u>3</u>	

C. Biology (Subtotal = <u>7.5</u>)	Absent	Weak	Moderate	Strong
18. Fibrous roots in streambed	<u>3</u>	2	1	0
19. Rooted upland plants in streambed	<u>3</u>	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	<u>1</u>	2	3
21. Aquatic Mollusks	<u>0</u>	1	2	3
22. Fish	<u>0</u>	0.5	1	1.5
23. Crayfish	<u>0</u>	0.5	1	1.5
24. Amphibians	0	<u>0.5</u>	1	1.5
25. Algae	<u>0</u>	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5; <u>Other = 0</u>			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/14	Project/Site: Candy	Latitude: 36.233863°N
Evaluator: JEckardt	County: Guilford	Longitude: -79.661670°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 22	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other 54 - Roadside e.g. Quad Name: channel abng (SCP18) Hopkins Road

A. Geomorphology (Subtotal = 8)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)

12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6.5)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: Flow is subsurface last 30' to Candy.
Stronger more consistent baseflow beyond project area.

NC DWQ Stream Identification Form Version 4.11

Date: 8/14/14	Project/Site: Carby	Latitude: 36.227997 °N
Evaluator: I. Eckardt	County: Guilford	Longitude: 79.664101 °W
Total Points: 24 Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*	Stream Determination (circle one) Ephemeral () Intermittent (X) Perennial ()	Other 55 - UT to (SCP 19) e.g. Quad Name: UT4

A. Geomorphology (Subtotal = 13.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5.5)

12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 5)

18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/15/2014	Project/Site: Candy Creek	Latitude: 36.223646°N
Evaluator: KB	County: Guilford	Longitude: -79.659533°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if $\geq 30^*$ 30.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other 56 - SCP20 e.g. Quad Name:

A. Geomorphology (Subtotal = 9.5)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 12.5)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 8.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: 3 cattails, 1 duckweed, 2 lily pads

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/15/2014	Project/Site: Candy	Latitude: 36.225220°N
Evaluator: KB	County: Guilford	Longitude: -79.660318°W
Total Points: <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i> 27.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: 57-SCP21

A. Geomorphology (Subtotal = 9.5)

	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^aartificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10.5)

12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/15/14	Project/Site: Candy	Latitude: 36.225365°N
Evaluator: I Eckardt	County: Guilford	Longitude: -79.660541°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 26	Stream Determination (circle one) Ephemeral <input type="checkbox"/> Intermittent <input checked="" type="checkbox"/> Perennial <input type="checkbox"/>	Other 58 - 30" long channel e.g. Quad Name: (SCP 22) begin at scp + 6' headcut on RB of Candy

A. Geomorphology (Subtotal = 11.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	2	(3)
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6.5)

18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 8/15/2014	Project/Site: Candy Creek	Latitude: 36.223068°N
Evaluator: KB	County: Swain	Longitude: -79.662681°W
Total Points: Stream is at least intermittent if ≥ 19 or perennial if ≥ 30* 21.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: S9-SCP23 Emergency spillway channel

A. Geomorphology (Subtotal = 7.5)

	Absent	Weak	Moderate	Strong
1 ^a . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

^a artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

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DWQ # _____

SCP 1 – Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 9:00 AM
5. Name of Stream: Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 1,400 Acres
8. Stream Order: Second
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration/enhancement
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.2 acre
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: 10 % Residential % Commercial % Industrial 60 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 15-20'
22. Bank Height (from bed to top of bank): 3-5'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 46 **Comments:** _____

Evaluator's Signature

Date 8/11/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	0
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	1
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	1
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	1
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	1
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						46

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 2 – Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 4:00 PM
5. Name of Stream: Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 900 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.2 acre
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: 10 % Residential % Commercial % Industrial 60 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 10-12'
22. Bank Height (from bed to top of bank): 5-8'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 50 Comments: _____

Evaluator's Signature

Ian Eckardt

Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	0
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	1
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	0
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	0
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	1
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	1
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						50

* These characteristics are not assessed in coastal streams.

SCP 3 – UT1C to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 10:00 AM
5. Name of Stream: UT1C to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 27 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Preservation/Restoration
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.2 acre
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: 10 % Residential % Commercial % Industrial 60 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 5-10'
22. Bank Height (from bed to top of bank): 3-6'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 62 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	1
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	3
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	4
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						62

* These characteristics are not assessed in coastal streams.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	1
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						55

* These characteristics are not assessed in coastal streams.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	1
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	1
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	1
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	4
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	1
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	1
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						41

* These characteristics are not assessed in coastal streams.

SCP 6 – UT2 to Candy Creek (Downstream) (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 1:00 PM
5. Name of Stream: UT2 to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 63 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Enhancement
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 1.0 acre
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 70 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 1-3'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 46 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	2
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	3
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						46

* These characteristics are not assessed in coastal streams.

SCP 7 – UT2 to Candy Creek (Upstream) (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



- 1. Applicant's Name: Wildlands Engineering, Inc
- 2. Evaluator's Name: Ian Eckardt
- 3. Date of Evaluation: 8/11/14
- 4. Time of Evaluation: 2:00 PM
- 5. Name of Stream: UT2 to Candy Creek
- 6. River Basin: Cape Fear 03030002
- 7. Approximate Drainage Area: 20 Acres
- 8. Stream Order: First
- 9. Length of Reach Evaluated: 200 lf
- 10. County: Guilford
- 11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
- 12. Site Coordinates (if known): N 36.233923°, W -79.661664°
- 13. Proposed Channel Work (if any): Enhancement/Restoration
- 14. Recent Weather Conditions: No rainfall previous 48 hours.
- 15. Site conditions at time of visit: partly sunny, 90°
- 16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
- 17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: acre
- 18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
- 20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 40 % Agricultural 60 % Forested % Cleared / Logged % Other ()
- 21. Bankfull Width: 4-6'
- 22. Bank Height (from bed to top of bank): 3-5'
- 23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
- 24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 47 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/11/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						47

* These characteristics are not assessed in coastal streams.

SCP 8A – UT2B to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



- 1. Applicant's Name: Wildlands Engineering, Inc
- 2. Evaluator's Name: Ian Eckardt
- 3. Date of Evaluation: 8/11/14
- 4. Time of Evaluation: 3:15 PM
- 5. Name of Stream: UT2B to Candy Creek
- 6. River Basin: Cape Fear 03030002
- 7. Approximate Drainage Area: 24 Acres
- 8. Stream Order: First
- 9. Length of Reach Evaluated: 200 lf
- 10. County: Guilford
- 11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
- 12. Site Coordinates (if known): N 36.233923°, W -79.661664°
- 13. Proposed Channel Work (if any): Enhancement
- 14. Recent Weather Conditions: No rainfall previous 48 hours.
- 15. Site conditions at time of visit: partly sunny, 90°
- 16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
- 17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
- 18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
- 20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 100 % Agricultural % Forested % Cleared / Logged % Other ()
- 21. Bankfull Width: 4-6'
- 22. Bank Height (from bed to top of bank): 2-3'
- 23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
- 24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 51 Comments: _____

Evaluator's Signature

Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	0
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						51

* These characteristics are not assessed in coastal streams.

SCP 8B – UT2B to Candy Creek (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



- 1. Applicant's Name: Wildlands Engineering, Inc
- 2. Evaluator's Name: Ian Eckardt
- 3. Date of Evaluation: 8/11/14
- 4. Time of Evaluation: 3:30 PM
- 5. Name of Stream: UT2B to Candy Creek
- 6. River Basin: Cape Fear 03030002
- 7. Approximate Drainage Area: 15 Acres
- 8. Stream Order: First
- 9. Length of Reach Evaluated: 200 lf
- 10. County: Guilford
- 11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
- 12. Site Coordinates (if known): N 36.233923°, W -79.661664°
- 13. Proposed Channel Work (if any): Enhancement
- 14. Recent Weather Conditions: No rainfall previous 48 hours.
- 15. Site conditions at time of visit: partly sunny, 90°
- 16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
- 17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
- 18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
- 20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 100 % Agricultural % Forested % Cleared / Logged % Other ()
- 21. Bankfull Width: 4-6'
- 22. Bank Height (from bed to top of bank): 2-3'
- 23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
- 24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 48 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	0
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						48

* These characteristics are not assessed in coastal streams.

SCP 9A – UT2A to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 4:45 PM
5. Name of Stream: UT2A to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 15 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Enhancement
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: 20 % Residential % Commercial % Industrial 40 % Agricultural 40 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 3-5'
22. Bank Height (from bed to top of bank): 2-3'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 55 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	2
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	4
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						55

* These characteristics are not assessed in coastal streams.

SCP 9B – UT2A to Candy Creek (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 4:30 PM
5. Name of Stream: UT2A to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 15 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Enhancement
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: 20 % Residential % Commercial % Industrial 40 % Agricultural 40 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 3-5'
22. Bank Height (from bed to top of bank): 2-3'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 45 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	2
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	2
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						45

* These characteristics are not assessed in coastal streams.

SCP 10 – UT3 to Candy Creek, Downstream (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/11/14
4. Time of Evaluation: 5:30 PM
5. Name of Stream: UT3 to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 78 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 2.1
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 75 % Agricultural 25 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 5-8'
22. Bank Height (from bed to top of bank): 5-8'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 50 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/11/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	0
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	1
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	0
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	0
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	1
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						50

* These characteristics are not assessed in coastal streams.

SCP 11 – UT3 to Candy Creek, Upstream (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



- 1. Applicant's Name: Wildlands Engineering, Inc
- 2. Evaluator's Name: Ian Eckardt
- 3. Date of Evaluation: 8/11/14
- 4. Time of Evaluation: 5:30 PM
- 5. Name of Stream: UT3 to Candy Creek
- 6. River Basin: Cape Fear 03030002
- 7. Approximate Drainage Area: 50 Acres
- 8. Stream Order: First
- 9. Length of Reach Evaluated: 200 lf
- 10. County: Guilford
- 11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
- 12. Site Coordinates (if known): N 36.233923°, W -79.661664°
- 13. Proposed Channel Work (if any): Preservation
- 14. Recent Weather Conditions: No rainfall previous 48 hours.
- 15. Site conditions at time of visit: partly sunny, 90°
- 16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
- 17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 2.1
- 18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
- 20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 75 % Agricultural 25 % Forested % Cleared / Logged % Other ()
- 21. Bankfull Width: 3-6'
- 22. Bank Height (from bed to top of bank): 1-3'
- 23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
- 24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 68 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/11/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	3
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	3
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	4
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						68

* These characteristics are not assessed in coastal streams.

OFFICE USE ONLY:

USACE AID# _____

DWQ # _____

SCP 12 – UT4 to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 9:00 AM
5. Name of Stream: UT4 to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 189 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 1.1
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 75 % Agricultural 25 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 8-12'
22. Bank Height (from bed to top of bank): 4-6'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 58 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	2
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	1
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	2
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	4
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						58

* These characteristics are not assessed in coastal streams.

SCP 13 – UT5 to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



- 1. Applicant's Name: Wildlands Engineering, Inc
- 2. Evaluator's Name: Ian Eckardt
- 3. Date of Evaluation: 8/12/14
- 4. Time of Evaluation: 9:00 AM
- 5. Name of Stream: UT5 to Candy Creek
- 6. River Basin: Cape Fear 03030002
- 7. Approximate Drainage Area: 100 Acres
- 8. Stream Order: First
- 9. Length of Reach Evaluated: 200 lf
- 10. County: Guilford
- 11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
- 12. Site Coordinates (if known): N 36.233923°, W -79.661664°
- 13. Proposed Channel Work (if any): Restoration
- 14. Recent Weather Conditions: No rainfall previous 48 hours.
- 15. Site conditions at time of visit: partly sunny, 90°
- 16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
- 17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.2
- 18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
- 20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 80 % Agricultural 20 % Forested % Cleared / Logged % Other ()
- 21. Bankfull Width: 8-12'
- 22. Bank Height (from bed to top of bank): 4-6'
- 23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
- 24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 52 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	1
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	1
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	1
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	3
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	3
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						52

* These characteristics are not assessed in coastal streams.

SCP 14A – UT5A to Candy Creek (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 10:00 AM
5. Name of Stream: UT5A to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 40 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Preservation
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.8
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 70 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 1-3'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 73 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	4
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	2
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	4
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	4
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	4
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						73

* These characteristics are not assessed in coastal streams.

SCP 14B – UT5A to Candy Creek (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 10:15 AM
5. Name of Stream: UT5A to Candy Creek
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 40 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 200 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Preservation
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 0.8
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 70 % Agricultural 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 2-3'
22. Bank Height (from bed to top of bank): 0.5-1'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 64 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	4
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	1
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	3
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	4
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						64

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 15 – S1 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 10:00 AM
5. Name of Stream: S1
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 8 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 20 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration proposed to Candy Creek at S1.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 85 % Agricultural
 15 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 2-4'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 41 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	0
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	3
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	1
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	3
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	1
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						41

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 16 – S2 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 11:00 AM
5. Name of Stream: S2
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 3 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 20 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration proposed to Candy Creek at S2.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO
19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 100 %
Agricultural % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 1-3'
22. Bank Height (from bed to top of bank): 1-2'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 37 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	0
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	2
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	2
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	3
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	4
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	1
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	0
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	1
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						37

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 17 – S3 (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 11:30 AM
5. Name of Stream: S3
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 5 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 100 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration proposed to Candy Creek at S3.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES **NO** If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES **NO** 19. Does channel appear on USDA Soil Survey? YES **NO**
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 20 % Agricultural 80 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 1-3'
22. Bank Height (from bed to top of bank): 1-2'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 59 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	4
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	3
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	3
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	3
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	5
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	1
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	4
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						59

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 18 – S4 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 1:30 PM
5. Name of Stream: S4
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 10 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 100 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): None
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: 1.3
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 80 % Agricultural 20 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 1-3'
22. Bank Height (from bed to top of bank): 1-2'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 56 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	2
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	3
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	2
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	2
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	3
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	4
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	4
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	5
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	4
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	4
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						56

* These characteristics are not assessed in coastal streams.

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DWQ # _____

SCP 19 – S5 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 1:30 PM
5. Name of Stream: S5
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 5 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 100 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration along UT4 at S5.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 0 % Agricultural
 100 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 5-8'
22. Bank Height (from bed to top of bank): 3-4'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 47 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	1
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	4
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	1
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						47

* These characteristics are not assessed in coastal streams.

SCP 20 – S6 (Perennial RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/12/14
4. Time of Evaluation: 3:30 PM
5. Name of Stream: S6
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 3 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 100 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration along Candy Creek in vicinity of S6.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 10 % Agricultural 90 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 2-3'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 58 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	4
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	4
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	4
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	1
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	3
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	1
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	3
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	2
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						58

* These characteristics are not assessed in coastal streams.

OFFICE USE ONLY:

USACE AID# _____

DWQ # _____

SCP 21 – S7 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/13/14
4. Time of Evaluation: 10:30 PM
5. Name of Stream: S7
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 3 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 30 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration along Candy Creek in vicinity of S7.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 80 % Agricultural
20 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 3-4'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 47 Comments: _____

Evaluator's Signature Ian Eckardt Date 8/12/14

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers in order to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 05/03. To Comment, please call 919-876-8441 x 26.

STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	4
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	2
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	1
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						47

* These characteristics are not assessed in coastal streams.

OFFICE USE ONLY:

USACE AID# _____

DWQ # _____

SCP 22 – S8 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/13/14
4. Time of Evaluation: 10:30 PM
5. Name of Stream: S8
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 3 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 30 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Restoration along Candy Creek in vicinity of S8.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 80 % Agricultural
 20 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 4-6'
22. Bank Height (from bed to top of bank): 3-4'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 49 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	3
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	5
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	3
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	3
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	0
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	1
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	1
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	3
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	4
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	2
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	2
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	3
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	1
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	2
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						49

* These characteristics are not assessed in coastal streams.

OFFICE USE ONLY:

USACE AID# _____

DWQ # _____

SCP 23 – S9 (Intermittent RPW)



STREAM QUALITY ASSESSMENT WORKSHEET



1. Applicant's Name: Wildlands Engineering, Inc
2. Evaluator's Name: Ian Eckardt
3. Date of Evaluation: 8/13/14
4. Time of Evaluation: 2:30 PM
5. Name of Stream: S9
6. River Basin: Cape Fear 03030002
7. Approximate Drainage Area: 5 Acres
8. Stream Order: First
9. Length of Reach Evaluated: 30 lf
10. County: Guilford
11. Location of reach under evaluation (include nearby roads and landmarks): From Greensboro, NC take Highway 29 north 11 miles then take a right onto Old Reidsville Road. Take Old Reidsville Road for 0.6 miles then take a left onto Hopkins Road and continue 0.5 miles. The project area is located on both sides of the bridge crossing of Candy Creek.
12. Site Coordinates (if known): N 36.233923°, W -79.661664°
13. Proposed Channel Work (if any): Preservation along UT5A in the vicinity of S9.
14. Recent Weather Conditions: No rainfall previous 48 hours.
15. Site conditions at time of visit: partly sunny, 90°
16. Identify any special waterway classifications known: Section 10 Tidal Waters Essential Fisheries Habitat Trout Waters Outstanding Resource Waters Nutrient Sensitive Waters Water Supply Watershed (I-IV)
17. Is there a pond or lake located upstream of the evaluation point? YES NO If yes, estimate the water surface area: _____
18. Does channel appear on USGS quad map? YES NO 19. Does channel appear on USDA Soil Survey? YES NO
20. Estimated Watershed Land Use: % Residential % Commercial % Industrial 70 % Agricultural
 30 % Forested % Cleared / Logged % Other ()
21. Bankfull Width: 2-3'
22. Bank Height (from bed to top of bank): 3-4'
23. Channel slope down center of stream: Flat (0 to 2%) Gentle (2 to 4%) Moderate (4 to 10%) Steep (>10%)
24. Channel Sinuosity: Straight Occasional Bends Frequent Meander Very Sinuous Braided Channel

Instructions for completion of worksheet (located on page 2): Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 36 **Comments:** _____

Evaluator's Signature Ian Eckardt **Date** 8/12/14

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STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
PHYSICAL	1	Presence of flow / persistent pools in stream (no flow or saturation = 0; strong flow = max points)	0 – 5	0 – 4	0 – 5	2
	2	Evidence of past human alteration (extensive alteration = 0; no alteration = max points)	0 – 6	0 – 5	0 – 5	1
	3	Riparian zone (no buffer = 0; contiguous, wide buffer = max points)	0 – 6	0 – 4	0 – 5	1
	4	Evidence of nutrient or chemical discharges (extensive discharges = 0; no discharges = max points)	0 – 5	0 – 4	0 – 4	4
	5	Groundwater discharge (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0 – 3	0 – 4	0 – 4	1
	6	Presence of adjacent floodplain (no floodplain = 0; extensive floodplain = max points)	0 – 4	0 – 4	0 – 2	0
	7	Entrenchment / floodplain access (deeply entrenched = 0; frequent flooding = max points)	0 – 5	0 – 4	0 – 2	1
	8	Presence of adjacent wetlands (no wetlands = 0; large adjacent wetlands = max points)	0 – 6	0 – 4	0 – 2	2
	9	Channel sinuosity (extensive channelization = 0; natural meander = max points)	0 – 5	0 – 4	0 – 3	0
	10	Sediment input (extensive deposition = 0; little or no sediment = max points)	0 – 5	0 – 4	0 – 4	4
	11	Size & diversity of channel bed substrate (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0 – 4	0 – 5	2
STABILITY	12	Evidence of channel incision or widening (deeply incised = 0; stable bed & banks = max points)	0 – 5	0 – 4	0 – 5	2
	13	Presence of major bank failures (severe erosion = 0; no erosion, stable banks = max points)	0 – 5	0 – 5	0 – 5	2
	14	Root depth and density on banks (no visible roots = 0; dense roots throughout = max points)	0 – 3	0 – 4	0 – 5	2
	15	Impact by agriculture or livestock production (substantial impact = 0; no evidence = max points)	0 – 5	0 – 4	0 – 5	2
HABITAT	16	Presence of riffle-pool/ripple-pool complexes (no riffles/ripples or pools = 0; well-developed = max points)	0 – 3	0 – 5	0 – 6	1
	17	Habitat complexity (little or no habitat = 0; frequent, varied habitats = max points)	0 – 6	0 – 6	0 – 6	1
	18	Canopy coverage over streambed (no shading vegetation = 0; continuous canopy = max points)	0 – 5	0 – 5	0 – 5	5
	19	Substrate embeddedness (deeply embedded = 0; loose structure = max)	NA*	0 – 4	0 – 4	2
BIOLOGY	20	Presence of stream invertebrates (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 5	0 – 5	0
	21	Presence of amphibians (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	22	Presence of fish (no evidence = 0; common, numerous types = max points)	0 – 4	0 – 4	0 – 4	0
	23	Evidence of wildlife use (no evidence = 0; abundant evidence = max points)	0 – 6	0 – 5	0 – 5	1
Total Points Possible			100	100	100	
TOTAL SCORE (also enter on first page)						36

* These characteristics are not assessed in coastal streams.

**Appendix 9: Meeting Minutes of Interagency Review Team (IRT)
Site Walk**



1430 S. Mint Street, Suite 104 · Charlotte, NC 28203 · Phone: 704.332.7754 · Fax: 704.332.3306

MEETING MINUTES

To: Jeff Schaffer
From: Shawn Wilkerson

Company: NC EEP
Date: April 17, 2014

Address: 217 West Jones Street, Suite 3000A
Raleigh, NC 27603
Cc: All meeting attendees
(list provided below)

**Re: Candy Creek IRT Site Walk
Contract No. 5794**

Meeting Attendee	Agency	Contact Email
Guy Pearce	NC EEP	guy.pearce@ncdenr.gov
Jeff Schaffer	NC EEP	jeff.schaffer@ncdenr.gov
Greg Melia	NC EEP	gregory.melia@ncdenr.gov
Sue Homewood	NC DWR	sue.homewood@ncdenr.gov
Ginny Baker	NC DWR	virginia.baker@ncdenr.gov
Eric Kulz	NC DWR	eric.kulz@ncdenr.gov
Tyler Crumbley	USACE	tyler.crumbley@usace.army.mil
David Bailey	USACE	david.e.bailey2@usace.army.mil
Shawn Wilkerson	Wildlands Engineering	swilkerson@wildlandseng.com
Christine Blackwelder	Wildlands Engineering	cblackwelder@wildlandseng.com

The meeting began at 9:00 am on Monday, April 14, 2014 at the Friendship Church parking lot in Brown Summit, NC. Shawn began with introducing the Candy Creek project and providing a brief overview of the existing conditions and design concepts. The project captures the majority of tributaries to Candy Creek and will focus on treating the watershed as a whole. There is a great deal of sand moving through the main stem of Candy Creek and potential aquatic habitats are limited. Wildlands believes the sand originates from severe headwater tributary erosion as well as bank erosion on Candy Creek. There are old road beds or pond embankments on the majority of the tributaries. Where the old beds/embankments have failed, they have become a sediment source to the overall stream system.

Eric asked if any restoration is proposed on intermittent streams. UT1d, which is intermittent, is proposed for full restoration. Shawn explained that UT1d is currently suffering from a massive valley failure, which in part is attributed to an old dam across UT1d that is now breached. Due to the extent of the impairment, full restoration is warranted to correct the system wide instability. Tyler asked if there was any preservation proposed on the project. Preservation is proposed on UT5a, upstream UT5, upstream UT3, upstream UT4, and downstream UT1c (all perennial). Preservation reaches will be surveyed for reference as appropriate. Shawn noted

that Wildlands was proposing 5:1 credit on preservation reaches as they are part of the watershed wide management that this project is undertaking.

The group traveled first to the top of the project, to the pond outlet at the top of Candy Creek. Shawn discussed how Candy Creek will be tied in to the stable channel just downstream of the pond. Candy Creek is connected to the floodplain here, but quickly incises. This stable tie-in point will allow for Priority 1 restoration on Candy Creek. The existing stream channel is much larger than the design channel will be so Wildlands plans to balance cut and fill requirements by creating vernal pools in and around the existing channel and borrowing soil from the adjacent farm fields. Discussions with the landowner about potential borrow areas are underway. The proposed design will meander through the existing trees to the greatest extent possible, but there will be some tree loss for construction access and in areas where the old channel needs to be filled. Tyler asked if Wildlands is concerned about planting a site that is largely shaded. Shawn said no – Wildlands has recently planted the Little Troublesome site, another EEP Full delivery project which is largely shaded, and is seeing great vegetative success particularly with late successional species such as oaks.

The group walked down Candy Creek Reach 1, along UT5, along UT3 (both the downstream, incised section below the old culvert, and the preservation reach above the culvert), UT4, and walked back out along UT5a. The group agreed that restoration as proposed in the conceptual plans is the appropriate level of intervention. In reviewing the preservation reaches on both UT3 and UT5a, the group was able to see an appropriately sized channel for the headwaters of this watershed (approximately 1 foot deep, top width of 7-8 feet), which framed the extreme level of incision and degradation present on the restoration reaches. Shawn pointed out that, along a portion of the UT3 preservation reach, the existing river left forested buffer width is less than 50 feet. Wildlands will plant additional bare roots in this area to provide a 50 foot forested buffer. Wildlands will also remove the existing trash heap present in this area.

The group returned to the trucks and drove around to the field upstream of UT2. The group review began at the pond located midway through UT2. This pond, which is covered in algae during the summer, will be removed as part of restoration. The stream will be restored through the old pond bed. Tyler and others inquired about how the grade through the pond will be dealt with during design, and what will be done with the sediment that has accumulated behind the dam. Shawn explained that, until the survey is complete, Wildlands doesn't know exactly how much sediment or drop will need to be addressed. The pond will be surveyed using a boat to get accurate pond bottom elevations. Shawn said that on past projects, Wildlands has dewatered the pond ahead of construction and pushed accumulated sediments onto the side slopes to dry before they are worked. There are seams of exposed bedrock along the sides of the pond, and there is a chance that bedrock may be encountered in the pond bottom.

Upstream of the pond, the group reviewed the section of UT2 that extends into the woods. The stream here has nice bedform, but is deeply incised with extreme erosion. Wildlands has proposed a Priority 3 approach where a bench will be excavated to allow floodplain access, and a very few structures will be placed as needed, for Enhancement Level I credit. Tyler suggested stockpiling and replacing topsoil due to the low quality of sub soils. UT2b, which joins UT2

upstream of the pond, is proposed for Enhancement Level II to include spot stabilization, planting, and cattle exclusion. The group agreed on these approaches for the streams. The group then moved below the pond to review the rest of UT2. The stream here is deeply incised, but regains some stability as it approaches Candy Creek. UT2 will need to be raised to meet the invert of the restored Candy Creek, which will also be raised as part of the design. The group also looked briefly at UT2a. There was some discussion as to whether an Enhancement Level I or Level II approach is more appropriate for this length of UT2. Shawn agreed that Wildlands will assess the approaches to these reaches more closely during design.

The group then reviewed Candy Creek Reach 2. This length of Candy Creek is still incised and is actively traversed by cattle, but exhibits a single row of mature trees on both banks. The group noted the absence of bed habitats on this reach. Wildlands proposes full restoration of Candy Creek to restore appropriate habitats, but will preserve some of the mature vegetation by bringing the new channel in and out of the old channel. An old concrete dam will also be removed on this reach. The group agreed on this approach.

While walking back out to the trucks, the group reviewed the upstream extents of UT2a at the edge of the field. Two headcuts, one which drops 3-4 feet, are present near the upstream extents. Wildlands will begin Priority 1 restoration at these headcuts and carry the design down to meet the invert of the new UT2 channel (below the old dam location). Above the existing headcuts, Wildlands proposes cattle exclusion, fencing, and planting (similar to Enhancement Level II). Wildlands has proposed the entire length of UT2a be considered for Enhancement Level I credit, which averages the design approaches that will be used. The group agreed that this is an appropriate level of credit given the amount of work proposed and the potential ecological lift.

The group drove around and accessed Candy Creek Reach 4. Tyler expressed concern over potential wetland impacts associated with design, and particularly referenced potential wet areas along river right on Candy Creek Reach 4. Shawn assured that the design will minimize wetland impacts as practical and that the easement boundaries will extend to the toe of the valley in areas where wetlands exist between the stream and valley walls. Wildlands will not knowingly exclude a valuable wetland from the easement even though wetland credits are not proposed as part of this project. This will provide a buffer in excess of the required 50 feet. The group traversed up Candy Creek Reach 4 and into the woods to Candy Creek Reach 3. Reach 3 is proposed for Enhancement Level II, which will include some well-placed structures to raise the bed slightly to lessen incision as well as treatment of invasive species in the existing buffer and spot treatment of erosion. As Reach 3 approaches Hopkins Road, the stream becomes more incised, and an Enhancement Level I approach is proposed here, which will include more profile work to continue to raise the stream bed as well as substantial bank grading with possibly some benching near the bridge at Hopkins Road. The group agreed this was the best approach for these reaches.

There is an old USGS gage on Candy Creek just upstream of Hopkins Road that has 7 years of data. Wildlands is in discussions with USGS to see if the gage can be reinstated. The group discussed that the bridge may be on DOT's list for replacement. David confirmed via email on

April 15 that the bridge on Hopkins Road is scheduled for replacement. Wildlands will coordinate with DOT to ensure the stream and bridge design work well together.

The group did not see UT1c and UT1d for lack of time. UT1c is mostly being preserved with a small degraded impoundment being removed at its headwaters (restoration) and UT1d is having an impoundment removed and failing valley walls stabilized (restoration).

Overall, the Corps expressed concern over the amount of invasive species work on the site. Tyler noted that multiflora rose is extremely prevalent throughout the project and total eradication may be difficult. Shawn assured that measures will be taken to combat the invasives throughout the monitoring period. Specifics on performance measures will be provided in the construction documents.

The meeting concluded at approximately 12:45 PM.

Meeting minutes compiled by Christine Blackwelder and reviewed by Shawn Wilkerson on 4/15/2014. Minutes were issued for comments on 4/17/2014. Comments from Tyler Crumbley (received 4/17/2014) are incorporated in this document.