DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

CESAW-RG/Tugwell August 11, 2014

MEMORANDUM FOR RECORD

SUBJECT: Cedar Creek - NCIRT Comments During 30-day Mitigation Plan Review

PURPOSE: The comments listed below were posted to the NCEEP Mitigation Plan Review Portal during the 30-day comment period in accordance with Section 332.8(g) of the 2008 Mitigation Rule.

NCEEP Project Name: Brown Creek Tributaries Restoration Project, Anson County, NC

USACE AID#: SAW-2013-00389
NCEEP #: 95718

30-Day Comment Deadline: July 19, 2014

1. *Eric Kulz, NCDWR, 11 July, 2014*:
   - Overall looks like a good project. Very detailed mit plan. Only issue with mit plan is no demonstration of flow in headwater valleys is indicated as part of the monitoring/performance standards. Monitoring wells/crest gauges document vertical movement of groundwater, but documentation that down valley surface flow within the valley feature is required in order to generate stream credit (length of valley).

2. *Travis Wilson, NCWRC, 16 July, 2014*
   - UT 2 has a very small drainage area, a headwater valley approach is proposed. The sponsor should demonstrate down valley flow in order to receive credit in this reach.

3. *Todd Tugwell, USACE, August 11, 2014*:
   - Section 6, which discusses the credit release schedule, shows only a 5 year monitoring window, but the project should be monitored for 7 years, consistent with the performance standards listed in Section 9. Please update the tables and discussion in Section 6 to address this.
   - Section 9.3, which deals with vegetation success, should specify that the tree survival performance standards applies to planted trees, not all trees.

- Section 10, which covers monitoring requirements, states that "the monitoring program will be undertaken for seven years or until the final success criteria are achieved, whichever is longer". It is expected that the monitoring will be conducted for the full 7 years. If the site is proposed for early closeout in accordance with current guidance (NCEEP monitoring guidance dated November, 2011), this must be approved by the IRT.

/s/
Todd Tugwell
Special Projects Manager
Regulatory Division

M E M O R A N D U M

WK DICKSON
community infrastructure consultants

720 Corporate Center Drive Raleigh, North Carolina 27607 919.782.0495 tel. 919.782.9672 fax

TO: **David Godley, EBX**

FROM: **Daniel Ingram, WKD**

DATE: **August 18, 2014**

RE: **NCIRT Review of the Cedar Creek Draft Mitigation Plan; SAW-2013-00389; NCEEP # 95718**

Listed below are the comments provided by the NCIRT to NCEEP on August, 11 2014 regarding the Cedar Creek Stream and Wetland Restoration Project Mitigation Plan and WKD's responses.

1. *Eric Kulz, NCDWR, 11 July, 2014*:
   - Overall looks like a good project. Very detailed mit plan. Only issue with mit plan is no demonstration of flow in headwater valleys is indicated as part of the monitoring/performance standards. Monitoring wells/crest gauges document vertical movement of groundwater, but documentation that down valley surface flow within the valley feature is required in order to generate stream credit (length of valley).

     Comments: Headwater valley restoration areas will be monitored to document intermittent or seasonal surface flow. This will be accomplished through direct observation, photo documentation of dye tests, and the use of stream gauge transducers with data loggers. The as-built survey and gauge placement will allow for documentation of the duration of surface flow.

2. *Travis Wilson, NCWRC, 16 July, 2014*
   - UT 2 has a very small drainage area, a headwater valley approach is proposed. The sponsor should demonstrate down valley flow in order to receive credit in this reach.

     Comments: Headwater valley restoration areas will be monitored to document intermittent or seasonal surface flow. This will be accomplished through direct observation, photo documentation of dye tests, and the use of stream gauge transducers with data loggers. The as-built survey and gauge placement will allow for documentation of the duration of down valley surface flow. Further, slope seepage flow was observed at UT2 throughout the data collection and

design phases of the project over multiple site visits. Landowner communication also indicated this reach is consistently flowing at the surface above the project easement.

3. *Todd Tugwell, USACE, August 11, 2014*:
   - Section 6, which discusses the credit release schedule, shows only a 5 year monitoring window, but the project should be monitored for 7 years, consistent with the performance standards listed in Section 9. Please update the tables and discussion in Section 6 to address this.

     Comments: Edits made in table and text.

   - Section 9.3, which deals with vegetation success, should specify that the tree survival performance standards applies to planted trees, not all trees.

     Comments: Edits made in text.

   - Section 10, which covers monitoring requirements, states that "the monitoring program will be undertaken for seven years or until the final success criteria are achieved, whichever is longer". It is expected that the monitoring will be conducted for the full 7 years. If the site is proposed for early closeout in accordance with current guidance (NCEEP monitoring guidance dated November, 2011), this must be approved by the IRT.

     Comments: Noted.

CEDAR CREEK STREAM AND WETLAND RESTORATION PROJECT

FINAL MITIGATION PLAN

SAMPSON COUNTY, NORTH CAROLINA, PROJECT # 95718

Prepared for:

North Carolina Ecosystem Enhancement Program

North Carolina Department of Environment and Natural Resources
1652 Mail Service Center
Raleigh, NC 27699-1652

August 2014

FINAL MITIGATION PLAN
August 2014

Cedar Creek
Sampson County, North Carolina
EEP Project ID 95718

Cape Fear River Basin
HUC 3030006090060

Prepared for:

NC Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, NC 27699-1652

Prepared by:

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909 Capability Drive, Suite 3100
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919-829-9909

WK Dickson & Co., Inc.
720 Corporate Center Drive
Raleigh, NC 27607
919-782-0495

EXECUTIVE SUMMARY

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

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

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

The Cedar Creek Stream Restoration Project is located within an agricultural watershed in Sampson County, North Carolina, approximately three miles southwest of Clinton. The stream channels have been heavily impacted by channelization and agricultural practices. The project will involve the restoration and protection of streams in the Great Coharie Creek watershed. The purpose of this restoration project is to restore and enhance a stream and wetland complex located within the Cape Fear River Basin.

The project is located in the Great Coharie Creek Watershed (http://portal.ncdenr.org/web/eep/priorities-map). This 14-digit Hydrologic Unit Code (HUC 03003006090060) is identified as a Targeted Local Watershed (TLW) in the Cape Fear River Basin Restoration Priority (RBRP). The 2009 Cape Fear RBRP identified water quality and agricultural impacts as major stressors within this TLW. The Cedar Creek Stream and Wetland Restoration Project was identified as a Stream and Wetland opportunity to improve water quality, habitat, and hydrology within the TLW.

The project area is comprised of a single easement area along four tributaries to Great Coharie Creek (UT1, UT2, UT3 and UT4). UT1 is the primary channel at this site, and has been channelized throughout the project area. It flows westward through the site from Boykin Bridge Road to Great Coharie Creek. The upper drainage of UT1 originates to the southwest of Boykin Bridge Road (SR 1214) near Butlers Crossroads. The tributaries UT2, UT3, and UT4 flow southward into UT1. UT2 begins at the confluence of two headwater streams and has been ditched to the edge of the field. Flow is redirected along the upslope side of the cultivated field to an unnamed tributary to Cedar Creek. This unnamed tributary (UT4) enters Cedar Creek upstream of the natural valley for UT2. UT3 begins below a pond east of the airport and has been channelized down to a cultivated field where it has been redirected to the west. The historical flow path continues in a southerly direction through the cultivated field to its confluence with UT1.

The site consists of cultivated farmland and wooded areas. The total easement area is 42.0 acres, 26.9 acres of which are wooded. The remaining area is agricultural or clear-cut. The wooded areas along the corridors designated for restoration are classified as disturbed deciduous forest, and invasive species are common along the enhancement reaches. Several ditches exist throughout the project and flow into the main channel. All existing agricultural channels are degraded to a point where they no longer access their floodplain, water quality is poor, and aquatic life is not supported. Little habitat is available to support aquatic life, and the channels are not maximizing their potential to filter nutrients because they are entrenched and/or have no buffer.

The objective for this restoration project is to restore wetland areas and design a natural waterway through a stream/wetland complex with appropriate cross-sectional dimension and slope that will provide function and meet the appropriate success criteria for the existing streams. Accomplishing this objective entails the restoration of natural stream characteristics, such as stable cross sections, planform, and in-stream habitat.

The floodplain areas will be hydrologically reconnected to the channel to provide natural exchange and storage during flooding events. The design will be based on reference conditions, USACE guidance (USACE, 2005), and criteria that are developed during this project to achieve success. Additional project objectives, such as restoring the riparian buffer with native vegetation, ensuring hydraulic stability, and eradicating invasive species, are listed in Section 1 along with several other project objectives.

The design approach for Cedar Creek is to combine the analog method of natural channel design with analytical methods to evaluate stream flows and hydraulic performance of the channel and floodplain. The analog method involves the use of a "template" stream adjacent to, nearby, or previously in the same location as the design reach. The template parameters of the analog reach are replicated to create the features of the design reach. The analog approach is useful when watershed and boundary conditions are similar between the design and analog reaches (Skidmore, et al., 2001). Hydraulic geometry was developed using analytical methods in an effort to identify the design discharge.

The headwater valley restoration approach is proposed along the upper end of UT2. The existing ditches/channels will be plugged and then backfilled to the extent possible such that cut and fill is balanced along the reach. Priority Level I restoration is proposed on UT2 and UT3 for the majority of the restoration reaches, the channel will be rerouted from its current location to adjacent natural valley features.

Enhancement Levels I and II are proposed for UT1 and Enhancement Level II only for UT4. Enhancement Level I will include grading floodplain benches, bank stabilization treatments, and habitat improvements, while Enhancement Level II will include minor bank grading and habitat improvements.

Wetland restoration will occur adjacent to UT1 and UT3. The approach is to reconnect the floodplain wetland to the stream, fill ditches, create shallow pool habitat, micro contour, and plant appropriate small stream swamp vegetation.

After completion of all construction and planting activities, the site will be monitored on a regular basis. A physical inspection of the site will be conducted a minimum of twice per year throughout the seven year post-construction monitoring period, or until performance standards are met. These site inspections will identify site components and features that require routine maintenance. The measure of stream restoration success will be documented bankfull flows and no change in stream channel classification. Sand bed channels are dynamic and minor adjustments to dimension and profile are expected. The measure of vegetative success for the site will be the survival of at least 210 trees per acre at the end of Year 7 of the monitoring period. Annual monitoring data will be reported using the EEP monitoring template.

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

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1 RESTORATION PROJECT GOALS AND OBJECTIVES

The proposed Cedar Creek Stream and Wetland Restoration Project will provide numerous ecological and water quality benefits within the Cape Fear River Basin. While many of these benefits are limited to the project area, others, such as pollutant removal and improved aquatic and terrestrial habitat, have more far-reaching effects. Expected improvements to water quality, hydrology, and habitat are outlined in **Table 1**.

Table 1. Design Goals and Objectives

Benefits Related to Water Quality	
Nutrient removal	Benefit will be achieved through filtering of runoff from adjacent agricultural fields through buffer areas, the conversion of active farm fields to forested buffers, improved denitrification and nutrient uptake through buffer zones, and installation of BMPs at the headwaters of selected reaches.
Sediment removal	Benefit will be achieved through the stabilization of eroding stream banks and reduction of sediment loss from field areas due to lack of vegetative cover. Channel velocities will also be decreased through a reduction in slope, therefore decreasing erosive forces.
Increase dissolved oxygen concentration	Benefit will be achieved through the construction of instream structures to increase turbulence and dissolved oxygen concentrations and riparian canopy restoration to lower water temperature to increase dissolved oxygen capacity.
Runoff filtration	Benefit will be achieved through the restoration of buffer areas that will receive and filter runoff, thereby reducing nutrients and sediment concentrations reaching water bodies downstream.
Benefits to Flood Attenuation	
Water storage	Benefit will be achieved through the restoration of buffer areas which will infiltrate more water during precipitation events than under current site conditions. Wetland areas will provide additional storage of runoff and flood waters.
Improved groundwater recharge	Benefit will be achieved through the increased storage of precipitation in buffer areas, ephemeral depressions, and reconnection of existing floodplain. Greater storage of water will lead to improved infiltration and groundwater recharge.
Improved/restored hydrologic connections	Benefit will be achieved by restoring the stream to a natural meandering pattern with an appropriately sized channel, such that the channel's floodplain will be flooded more frequently at flows greater than the bankfull stage.
Benefits Related to Ecological Processes	
Restoration of habitats	Benefit will be achieved by restoring riparian buffer habitat to appropriate bottomland hardwood ecosystem. Protected riparian corridors will create contiguous natural areas with uninterrupted migration corridors.
Improved substrate and instream cover	Benefit will be achieved through the construction of instream structures designed to improve bedform diversity and to trap detritus. Stream will be designed with the appropriate channel dimension and will prevent aggradation and sedimentation within the channel. Substrate will become coarser as a result of the stabilization of stream banks and an overall decrease in the amount fine materials deposited in the stream.
Addition of large woody debris	Benefit will be achieved through the addition of wood structures as part of the restoration design. Such structures may include log vanes, root wads, and log weirs.
Reduced temperature of water due to shading	Benefit will be achieved through the restoration of canopy tree species to the stream buffer areas.
Restoration of terrestrial habitat	Benefit will be achieved through the restoration of riparian buffer bottomland hardwood habitats.

The Cedar Creek Stream and Wetland Restoration Project is located in the Great Coharie Creek Watershed (http://portal.ncdenr.org/web/eep/priorities-map). This 14-digit Hydrologic Unit Code (HUC 03003006090060) and is identified as a Targeted Local Watershed (TLW) in the Cape Fear River Basin Restoration Priority (RBRP).

The North Carolina Ecosystem Enhancement Program (EEP) develops River Basin Restoration Priorities (RBRP) to guide its restoration activities within each of the state's 54 cataloging units. RBRPs delineate specific watersheds that exhibit both the need and opportunity for wetland, stream and riparian buffer restoration. These TLWs receive priority for EEP planning and restoration project funds. Currently, no Local Watershed Plan (LWP) is available for the project area.

The 2009 Cape Fear RBRP identified water quality and agricultural impacts as major stressors within this TLW. The Cedar Creek Stream and Wetland Restoration Project was identified as a Stream and Wetland opportunity to improve water quality, habitat, and hydrology within the TLW.

The project goals address stressors identified in the TLW, and include the following:

- Water quality improvements,
- Natural resource protection, and
- Manage agricultural impacts.

The project goals will be addressed through the following project objectives:

- Converting active farm fields to forested buffers,
- Stabilization of eroding stream banks,
- Reduction in stream bank slope,
- Restoration of riparian buffer bottomland hardwood habitats, and
- Construction of in-stream structures designed to improve bedform diversity.

2 SITE SELECTION

2.1 Directions to the Project Site

The Cedar Creek Stream and Wetland Site is located in Sampson County approximately 3.1 miles southwest of Clinton, NC (**Figure 1**). To access the Site from the town of Clinton, travel west on Highway 24 (Sunset Avenue), take a left onto Airport Road and go 1.3 miles. Turn right onto West Main Street Extension, go approximately 350 feet, and turn left onto a dirt farm path. Follow the farm path along the cultivated field edge to the southwest corner and enter the forest. Follow the dirt path to cultivated fields adjacent to the project below UT2. Turning to the left will take you to UT2. Going to the right will take you to UT3.

2.2 Site Selection

2.2.1 USGS Hydrologic Unit Code

The site is located in the Cape Fear River Basin within Cataloging Unit 03030006. The project is located within the Cape Fear River Basin (8-digit USGS HUC 03030006, 14-digit USGS HUC 03030006090060) (USGS, 1998).

2.2.2 Project Components and Structure

Table 2. Cedar Creek Project Components – Stream Mitigation.

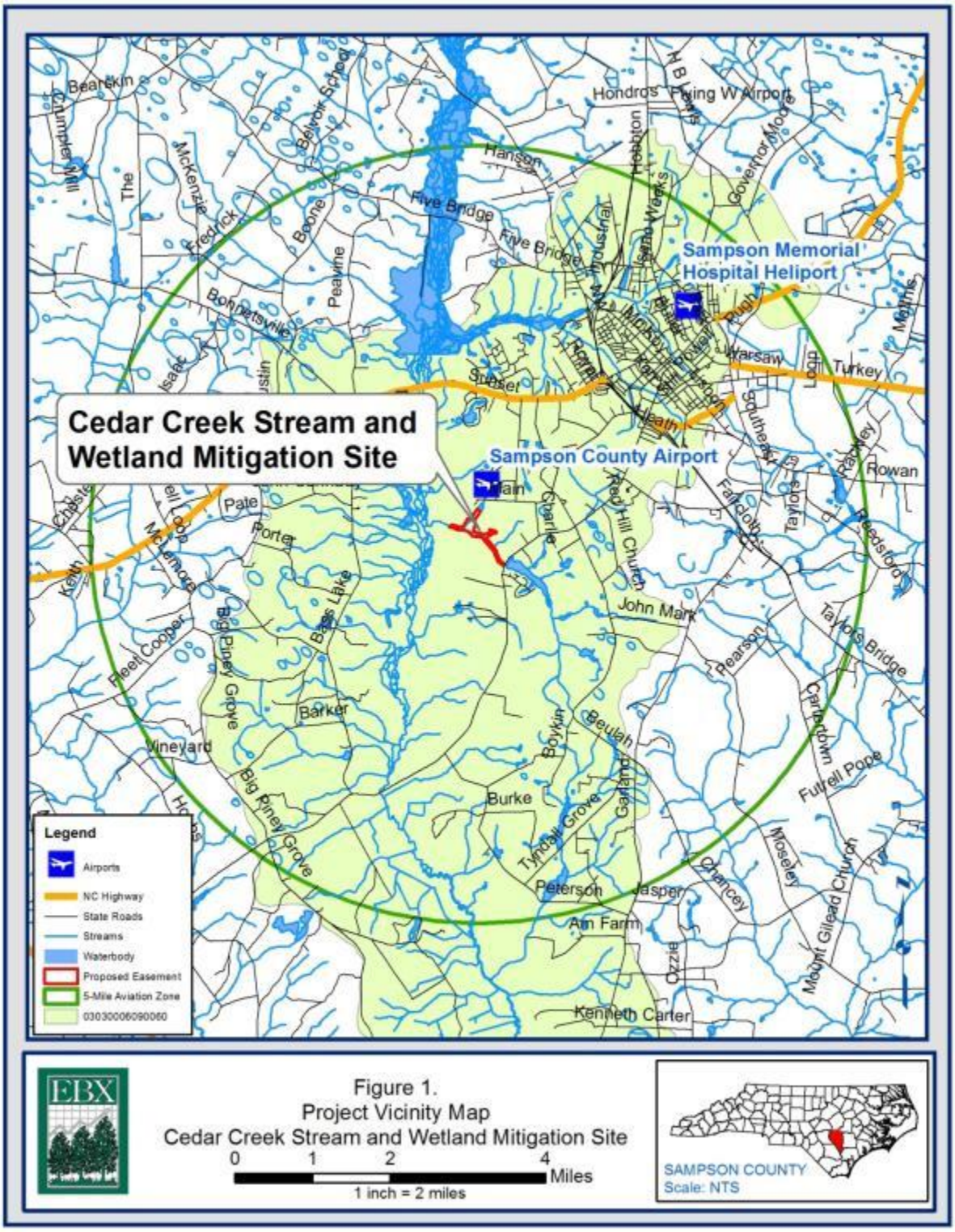
Reach	Mitigation Type	Proposed Stationing	Existing Length (LF)	Proposed Length (LF)	Mitigation Ratio	SMUs
UT1	Enhancement II	1+01 to 31+65	3,064	3,064	1:2.5	1,226
UT1	Enhancement I	31+65 to 35+80	415	415	1:1.5	277

UT1	Enhancement II	35+80 to 41+95	615	615	1:2.5	246
UT1	Enhancement I	41+95 to 44+60	265	265	1:1.5	177
UT1	Enhancement II	44+60 to 53+51	891	827	1:2.5	331
UT2	Headwater Valley	0+11 to 3+48	364	337	1:1	337
UT2	P1 Restoration	3+48 to 9+12	587	504	1:1	504
UT2-C	Headwater Valley	0+02 to 1+92	NA	190	1:1	190
UT3	P1 Restoration	0+60 to 19+72	1,428	1,912	1:1	1,912
UT4	Enhancement II	0+36 to 1+14	78	78	1:2.5	31
		Total	**7,707**	**8,207**		**5,231**

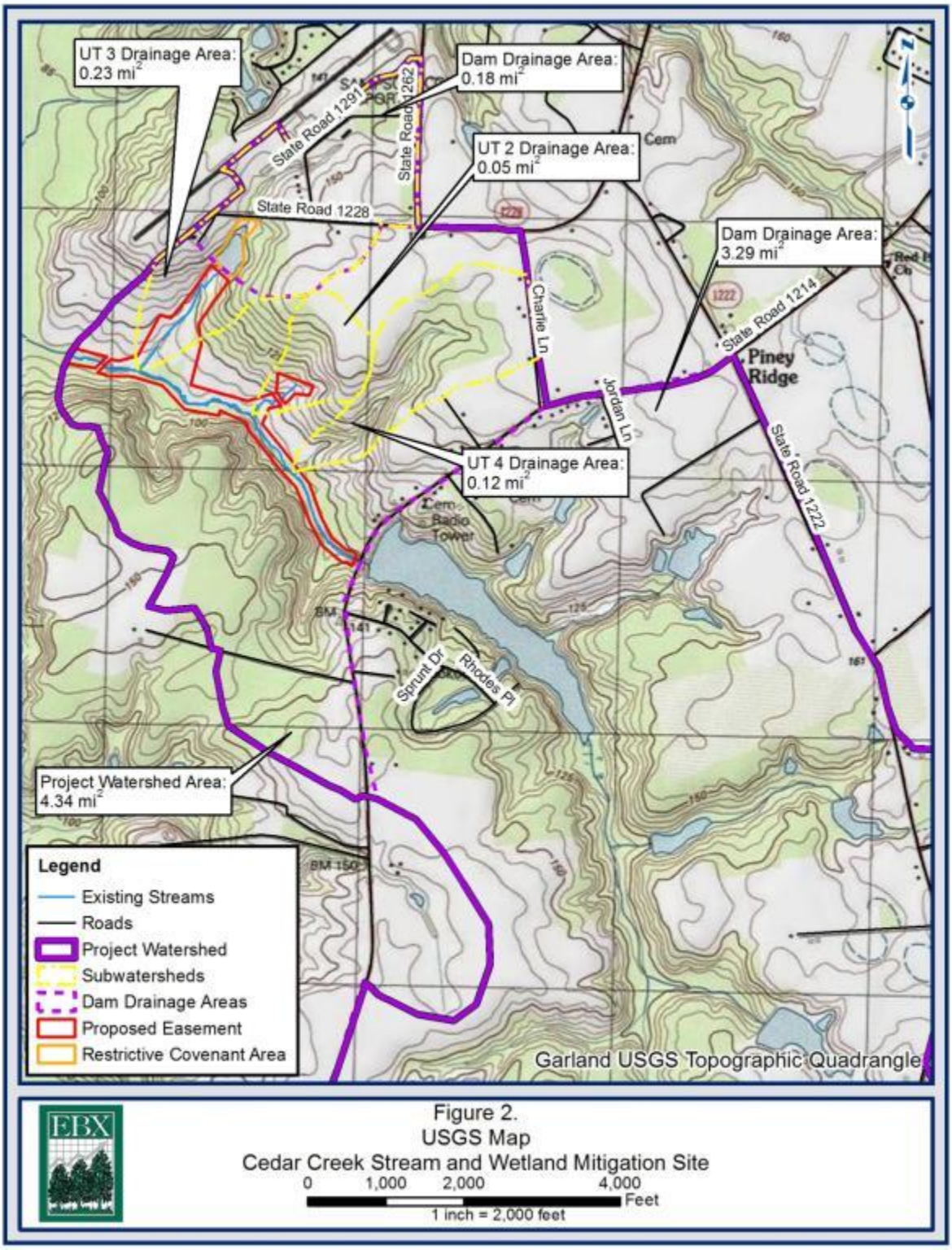
Table 3. Cedar Creek Project Components – Wetland Mitigation.

Wetland	Mitigation Type	Mitigation Area (ac)	Mitigation Ratio	WMUs
W1	Restoration	13.1	1:1	13.1
	Total	**13.1**		**13.1**

2.3 Vicinity Map



2.4 Watershed Map



2.5 Soil Survey

The Cedar Creek site is located in the Coastal Plain Physiographic Province. It is the most productive aquifer in North Carolina. The topography of the area is generally flat with elevations ranging from 87 to 115 feet. Flooding in low lying areas is common throughout the county. The watershed is underlain by the Black Creek formation, which is sedimentary in origin and composed of Cretaceous or Tertiary-age fine-grained micaceous sand, glauconitic, and fossiliferous clayey and sand lenses. This formation serves as the major aquifer for the area.

The Sampson County Soil Survey depicts a limited number of soil types as present within the project area (**Figure 3**). The three soil mapping units present are Johns fine sandy loam, Bibb and Johnston soils, and Marvyn loamy sand.

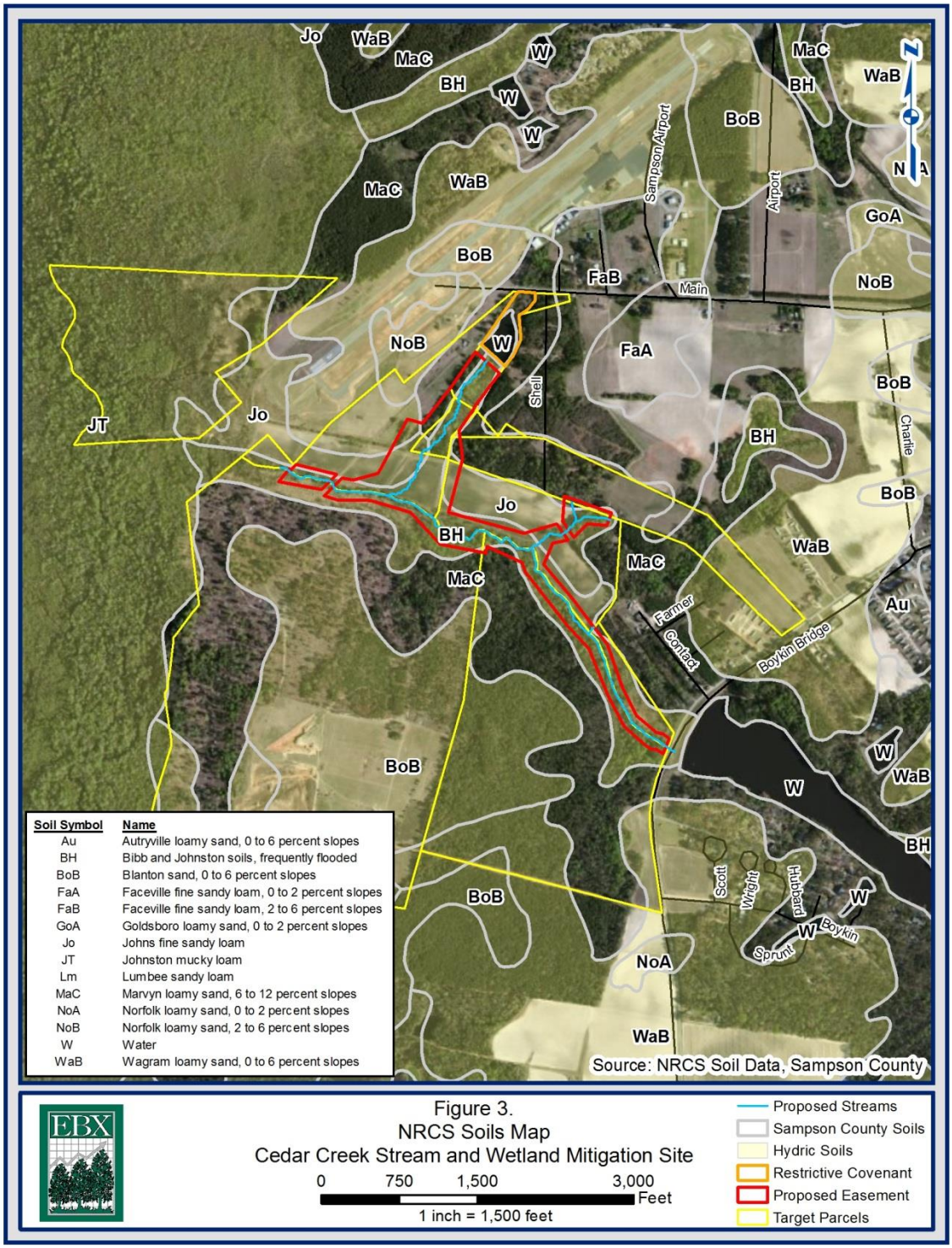
Bibb and Johnston soils (BH), frequently flooded. This map unit is typically made up of about 45 percent poorly drained Bibb soil and 35 percent very poorly drained Johnston soil. They are commonly flooded and runoff is very slow. This soil formed in loamy and sandy fluvial sediments on the floodplain of major stream systems. They have moderate to moderately rapid permeability when the water table is low. The seasonal high water table is at or near the surface for several months. The Johnston soil has high organic matter content. This soil unit is poorly suited to crops due to the lack of a suitable outlet for drainage systems. Wetness and flooding are the main limitation to development. This soil is considered to be hydric by the NRCS.

Johns fine sandy loam (Jo). This unit is a somewhat poorly to moderately well drained soil found on stream terraces. This unit has moderate permeability with low runoff and is rarely flooded. The seasonal high water table ranges from 18 to 36 inches below the surface. It often has sandy clay loam subsoil. This soil is considered to have hydric inclusions by the NRCS.

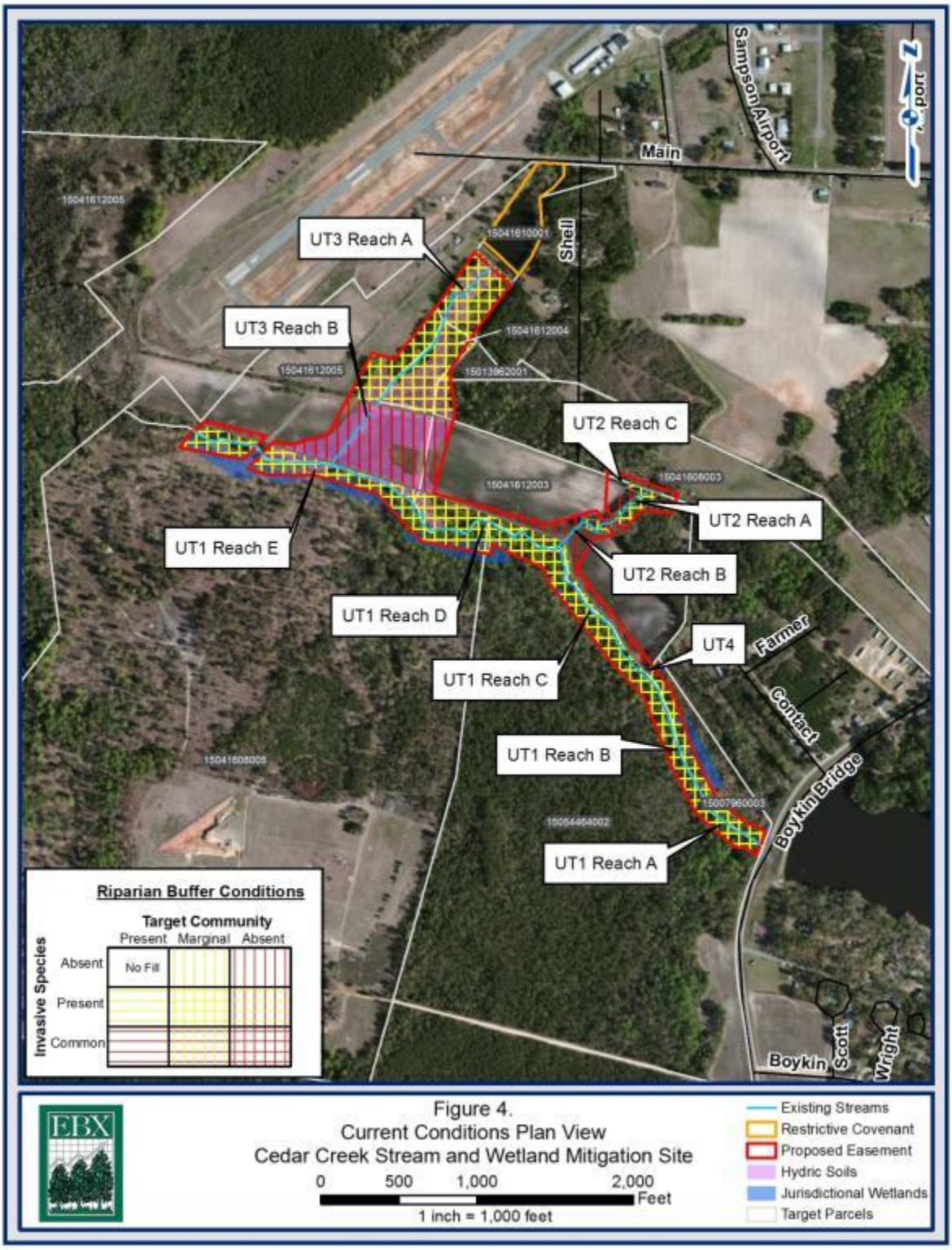
Marvyn loamy sand (MaC), 6 to 12 percent slopes. This unit is a well-drained soil along the side slopes of major drainages. It has moderate permeability and runoff is medium. This soil unit is used for woodland, pasture, and forage crops, but is poorly suited to row crops due to slope, surface runoff, and potential for erosion. The depth to seasonal high water table is greater than six feet. It has clayey subsoil. This soil is not considered hydric when undrained by the NRCS.

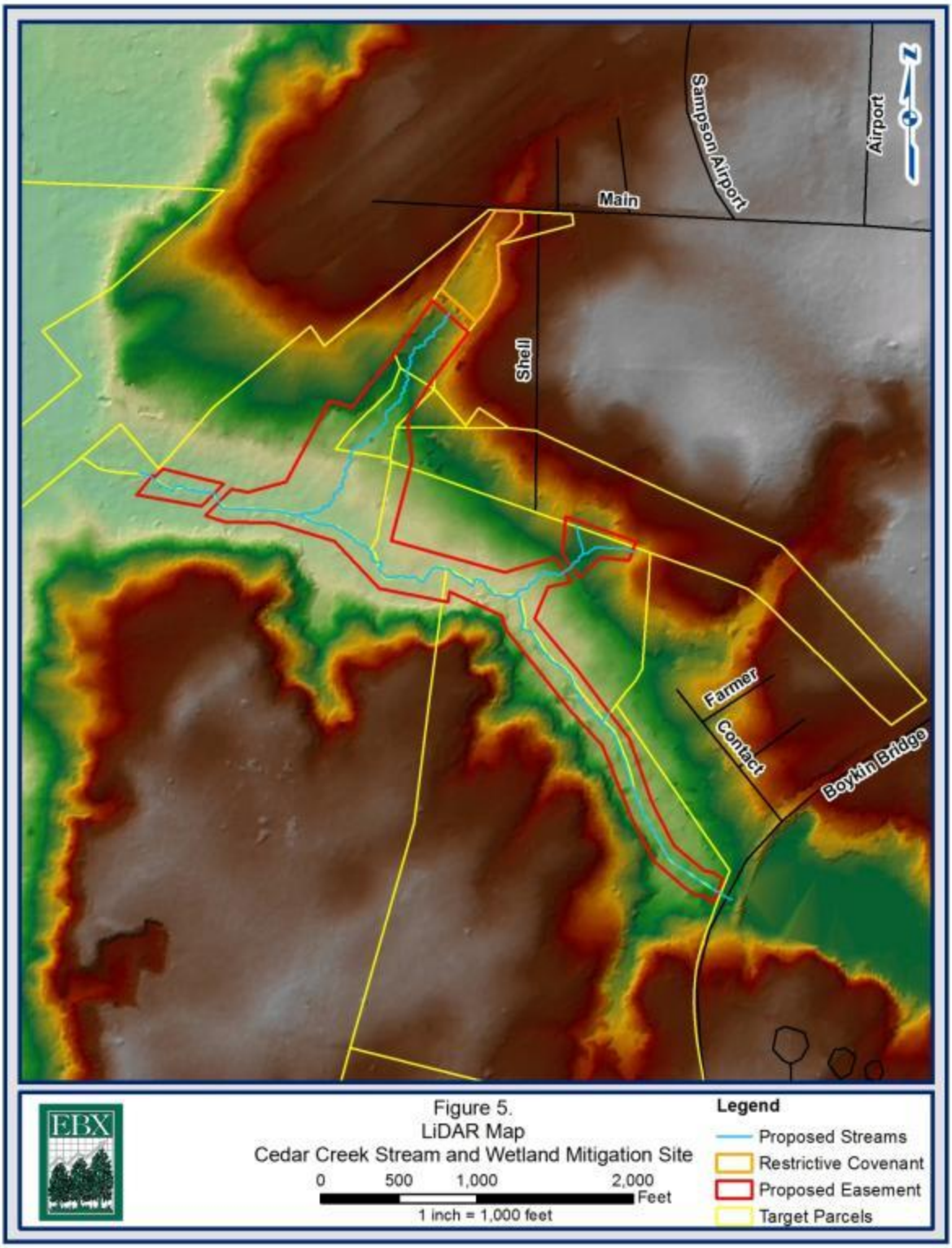
Of the three mapped soil series that occur throughout the project, the majority consists of Bibb and Johnston soils. Johns fine sandy loam (JO) is mapped on the gently sloping adjacent low terrace. The upland Marvyn soil (MaC) is mapped on the slopes just outside of the project area. A field determination is necessary to determine the presence and extent of hydric indicators at the site.

2.6 NRCS Soil Map

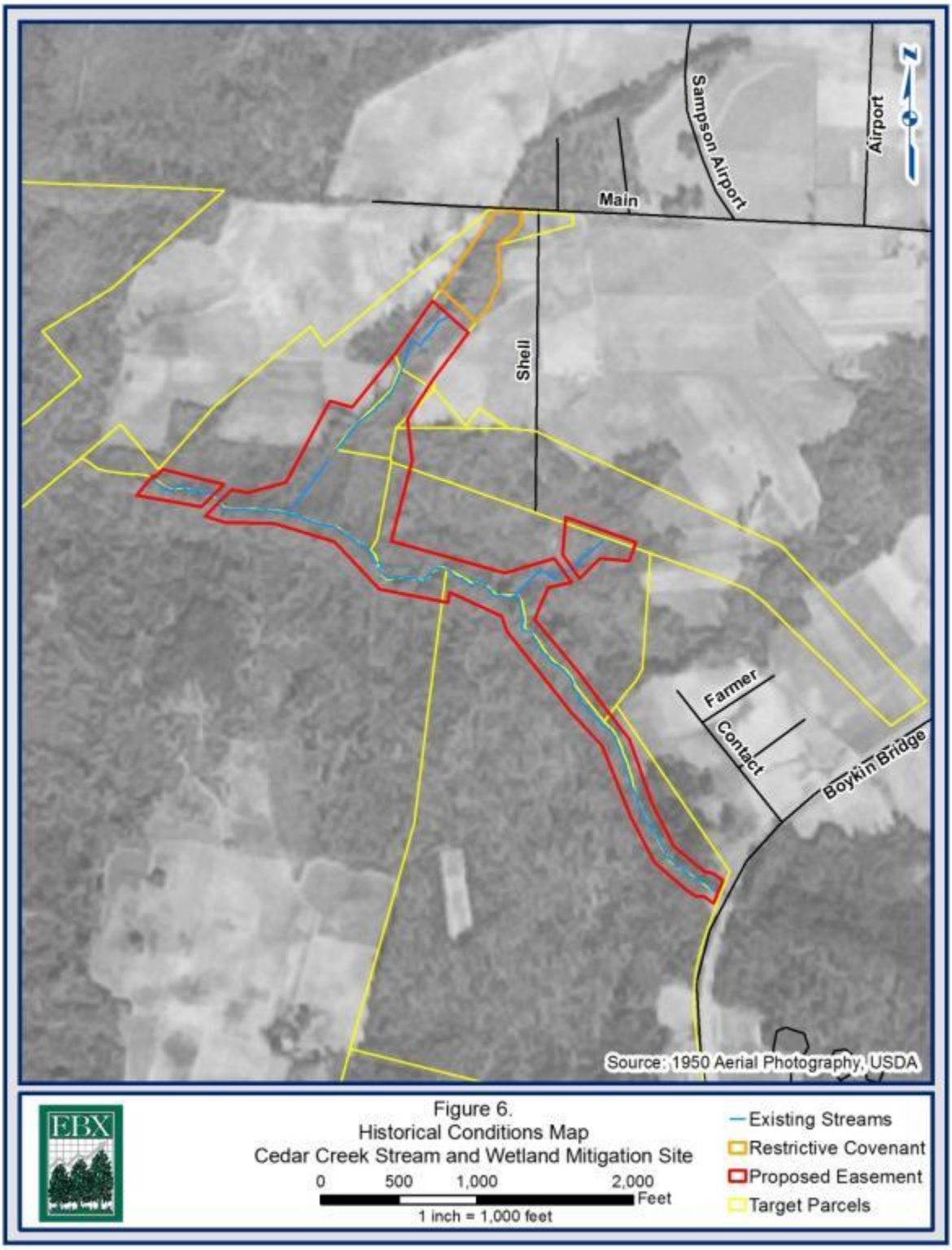


2.7 Current Conditions Plan View




Sampson Airport
Airport
Main
Shell
Farmer
Contact
Boykin Bridge
N
EBX
Figure 5.
LiDAR Map
Cedar Creek Stream and Wetland Mitigation Site
0 500 1,000 2,000
Feet
1 inch = 1,000 feet
Legend
Proposed Streams
Restrictive Covenant
Proposed Easement
Target Parcels

2.8 Historical Conditions Plan View



2.9 Site Photographs


Facing upstream on UT1 – Reach E. 8/06/2013


Facing downstream on UT1 - Reach C-D. 8/06/2013


Facing downstream on UT2. 7/25/2013


Facing upstream on UT2. 7/25/2013


UT3 existing ditch. 1/31/2013


Wetland 1 – upper end of wetland restoration area. 1/31/2013

UT1 facing downstream with Wetland 1 on the right bank. 1/31/2013

Facing downstream beside UT3 existing ditch and within Wetland 1. 1/31/2013

3 SITE PROTECTION INSTRUMENT

3.1 Site Protection Instrument Summary Information

The land required for the construction, management, and stewardship of this mitigation project includes portions of the following parcels. A copy of the land protection instrument(s) is included in **Appendix 5**.

PIN	Landowner	County	Acreage
15007960003	Hamilton, Ralph Harvey	Sampson	2.22
15041612005	Hamilton, Frances Johnson C/O Johnny Hamilton	Sampson	11.48
15041612004	Hamilton, Frances Johnson C/O Johnny Hamilton	Sampson	3.15
15041612003	Hamilton, Frances Johnson C/O Johnny Hamilton	Sampson	9.13
15041608005	Hamilton, Ralph H. LP Hamilton	Sampson	4.81
15041608003	Hamilton, Ralph H. LP Hamilton	Sampson	1.03
15013962001	Hamilton, Ralph Harvey	Sampson	0.07
15041610001	Hamilton, W. E. Children	Sampson	3.01
15054464002	Nuckolls, Mary Lily Johnson Dana, Faison Nuckolls	Sampson	7.10
		TOTAL	**42.0**

3.2 Site Protection Instrument Figure

The site protection instrument figure will be inserted when it becomes available.

4 BASELINE INFORMATION

4.1 Watershed Summary Information

4.1.1 Drainage Area

The easement totals 42.0 acres and is broken into four tributaries, UT1, UT2, UT3, and UT4. The land use in the 2,778-acre (4.34 mi^2) project watershed that drains to UT1 consists of row crop production, livestock production, silviculture, and sand mining areas. Current land use practices have caused increased erosion and sedimentation along drainage-ways and stream banks in the watershed.

UT2 has a drainage area of 32 acres (0.05 mi^2) and flows southwest into UT1. Land use in this small drainage area consists entirely of row crop production and disturbed hardwood forest. UT2 originates in a disturbed hardwood forest and flows through a cultivated field to its confluence with UT1.

UT3 has a drainage area of 147 acres (0.23 mi^2) and flows south into UT1. Land use in this drainage area consists of row crop production, historical and future livestock production, disturbed hardwood forest, maintained open space, and impervious surfaces associated with residential commercial development. Portions of the Sampson County Airport, including parts of the runway, terminal, and apron areas, lie within the UT3 drainage area. UT3 originates at a pond that is adjacent to the airport property. This reach flows through a disturbed hardwood forest, and then through a cultivated field to its confluence with UT1.

UT4 has a drainage area of 77 acres (0.12 mi^2), originates within a disturbed hardwood forest, and flows southwest into UT1. Land use in this small drainage area consists of a mix of row crop production and disturbed hardwood forest located primarily along the drainage way.

UT2, UT3 and UT4 have been straightened, dredged, or re-aligned in the past to promote drainage. Soil investigations show that much of the low-lying landscape adjacent to UT1 and its confluences with UT2 and UT3 exhibits hydric characteristics and a shallow seasonal high water table. The low lying fields in this area are considered prior converted wetlands (PC) that were drained and are currently utilized for row crop and livestock production.

4.1.2 Surface Water Classification

The site is located in the Cape Fear River Basin within Cataloging Unit 03030006 (NCDWQ 10 Digit Watershed HUC 0303000604; Stream Index # 18-68-1). The current State classification for the Cedar Creek restoration reaches is undefined. UT1 is the main stem of the project, which runs directly into Great Coharie Creek. Great Coharie Creek is defined as Class C S*w* (NCDWQ, 2012). Class C waters are suitable for aquatic life, secondary recreation, fishing, fish consumption and wildlife. The *Sw* is a designation for swamp waters—waters that have low velocities and other natural characteristics that are different from adjacent streams. Great Coharie Creek is not listed as a 303(d) listed stream.

4.1.3 Historical Land Use and Development Trends

Aerial imagery and information provided by the property owners indicate that the subject site has been used for a mix of agricultural purposes and undeveloped land prior to 1979 (**Figure 4 and Figure 6**). The Sampson County Airport was constructed prior to 1974. Between 1958 and 1979, the land adjacent to the right bank of the channel, including wetlands, was cleared and ditched for agricultural row crop production, while the area surrounding UT3 was used for pasture. Upstream Boykin Lake was also constructed during this time. By 1979 the cultivated field along Cedar Creek was shown as prior converted by the NRCS. Since 1981 the immediate watershed has slowly

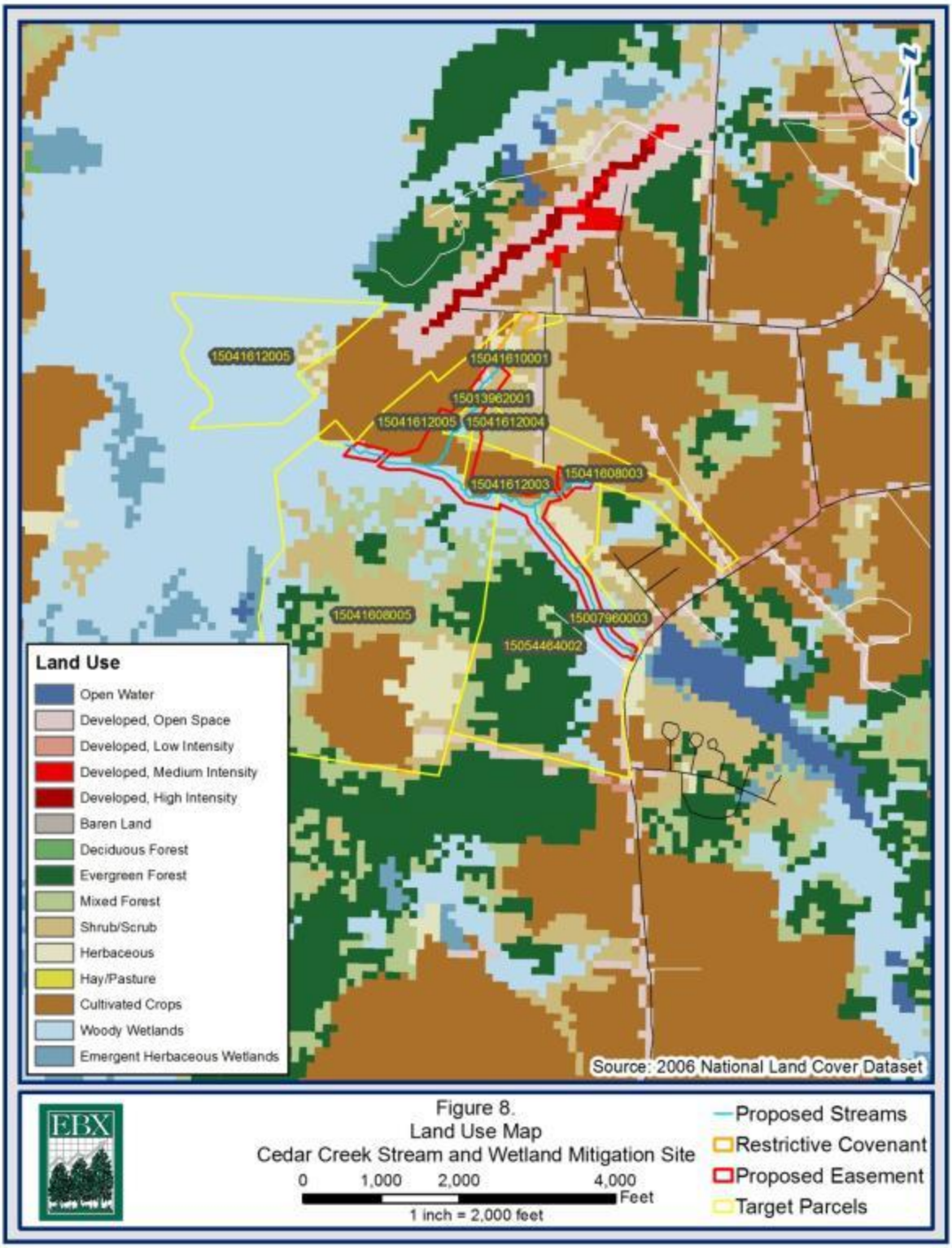
developed to include more residential homes. Between 1993 and 1998 a timber harvest was done in the watershed for UT2 and UT3. Little has changed since 1998 in regards to the development of the project site and nearby surrounding property, with the exception of a runway extension that was added in 2005-2006. The area remains in an agricultural community with some neighboring property forested. Historical land use and development trends are summarized in **Table 4**.

All of the facts in **Section 4.1.1** support the notion that several watershed characteristics, such as groundwater, vegetation, surface drainage, and potentially soil parameters, have been modified. Soil structure and surface texture have been altered from intensive agricultural operations, and, although most of the soils characterized on the site are classified as poorly drained, the ditching system has caused these soils to be effectively drained.

Table 4. Historical Land Use and Development Trends.

Date	Land Use and Development Observations*
1951	Conditions consist of forested land and limited agricultural fields in higher landscape positions. Project area is forested.
1958	Surrounding land use mostly unchanged.
1979	Land use conditions have moved toward agriculture use Left bank remains forested. Right bank and floodplain of project area have been cleared and field ditched. Pond has been constructed at upstream end of UT2. Area along UT2 has been thinned. UT3 has been channelized. Agricultural fields in project areas are shown by NRCS as Prior Converted. Upstream Boykin Lake constructed.
1981	Project area appears to be pasture/hayfield along right bank. UT2 has been channelized from pond to UT1. The Sampson County Airport has been constructed to the northeast of the site.
1993	Area along UT2 in floodplain of UT1 has been cleared and channelized. Watershed with increased residences.
1998	Timber harvesting in watersheds for UT2 and UT3. Surrounding land use mostly unchanged.
2005	Surrounding land use mostly unchanged.
2006	Runway extended. Surrounding land use mostly unchanged.
2008	Surrounding land use mostly unchanged. Depicts current site conditions.

* Observations based on aerial imagery and landowner communication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15013962001
15041612005
15041612004
15041612003
15041608003
15041608005
15007960003
15054464002
Land Use
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Baren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Herbaceous
Hay/Pasture
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Source: 2006 National Land Cover Dataset
EBX
Figure 8.
Land Use Map
Cedar Creek Stream and Wetland Mitigation Site
0 1,000 2,000 4,000
Feet
1 inch = 2,000 feet
Proposed Streams
Restrictive Covenant
Proposed Easement
Target Parcels

4.1.4 Endangered/Threatened Species

Plants and animals with a federal classification of endangered or threatened are protected under provisions of Sections 7 and 9 of the Endangered Species Act of 1973, as amended. Rare and protected species listed for Sampson County, and any likely impacts to the species as a result of the project construction, are discussed in the following sections.

The US Fish and Wildlife Service (USFWS) database (updated 03 December 2012) lists three endangered species for Sampson County, North Carolina: red-cockaded woodpecker (*Picoides borealis*), wood stork (*Mycteria Americana*), and pondberry (*Lindera melissifolia*). The American alligator (*Alligator mississippiensis*) is listed as Threatened due to similarity of appearance, but is not protected. No protected species or potential habitat for protected species was observed during preliminary site evaluations.

In addition to the USFWS database, the NC Natural Heritage Program (NHP) GIS database was consulted to determine whether previously cataloged occurrences of protected species were mapped within one mile of the project site. Results from NHP indicate that there are no known occurrences within a one-mile radius of the project area. Based on initial site investigations, no impacts to federally protected species are anticipated as a result of the proposed project.

WK Dickson submitted a request to USFWS for review and comments on the proposed Cedar Creek Stream Restoration Project on January 22, 2013 in regards to any potential impacts to threatened and endangered species. A response from USFWS received on March 11, 2013 stated that the proposed Project "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 [Endangered Species] Act". The USFWS did express concern that sedimentation resulting from the Project may impact aquatic species. They recommend "that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing…stringent sediment and erosion control measures".

The proposed project offers some potential to improve or create suitable habitat for several Federal Species of Concern. Habitat may be improved or created for species that require riverine habitat by improving water quality, in-stream and near-stream forage, and providing stable conditions not subject to regular maintenance. Improved riparian and stream habitat may benefit American eel (*Anguilla rostrata*), broadtail madtom (*Noturus* sp. cf. *leptacanthus*), American sand burrowing mayfly (*Dolania americana*), Atlantic pigtoe (*Fusconaia masoni*), yellow lampmussel (*Lampsilis cariosa*), raven's Seedbox (*Ludwigia ravenii*), Carolina bogmint (*Macbridea caroliniana*), and Carolina gopher frog (*Rana capito*).

4.1.5 Cultural Resources

Cultural resources include historic and archeological resources located in or near the project area. WK Dickson completed a preliminary survey of cultural resources to determine potential project impacts. No architectural structures or archeological artifacts have been observed or noted during surveys of the site for restoration purposes. In addition, the majority of the site has historically been disturbed due to agricultural practices and channel modifications.

WK Dickson submitted a request to the NC State Historic Preservation Office (SHPO) to search records to determine the presence of any areas of architectural, historic, or archaeological significance that may be affected by the Cedar Creek Stream Restoration Project on January 22, 2013. In a letter dated January 31, 2013 (**Appendix 3**), the SHPO stated that they had "conducted a review of the project and are aware of no historic resources which would be affected by the project."

4.2 Reach Summary Information

The project area is comprised of a single easement area along four tributaries to Great Coharie Creek (UT1, UT2, UT3, and UT4). UT1 is the primary channel at this site, and has been channelized throughout the project area. It flows westward through the site from Boykin Bridge Road to Great Coharie Creek. It is divided into five reaches (UT1A, UT1B, UT1C, UT1D, and UT1E). The upper drainage of UT1 originates to the southwest of Boykin Bridge Road (SR 1214) near Butlers Crossroads. The tributaries UT2, UT3, and UT4 flow southward into UT1.

Reach UT1A starts immediately downstream of Boykin Bridge Road and below Boykin Lake. Reaches UT1A and UT1B are stable with a woody buffer. The left bank is a mature bottomland forest, and, although the right bank contains mature trees limited to the top of bank, the buffer beyond is dominated by privet.

Reaches UT1C and UT1D are moderately stable and somewhat straight. The cultivated fields adjacent to or slightly removed from the channel bank develop areas of concentrated flow and erosion gullies along the right bank. The left bank consists of a five year old clear-cut and a small area of mature bottomland forest. Within the clear-cut area are jurisdictional wetlands (**Figure 4**). Spoil is present along the left bank throughout. Remnants of an older abandoned channel are visible behind the spoil.

Reach UT1E exhibits areas of erosion from the adjacent cultivation and evidence of sediment is present along the narrow woody buffer.

UT2 begins at the confluence of two shallow drainage features and is divided into two reaches (UT2A and UT2B). UT2A has currently been ditched to the edge of the field. Flow is a redirected flow along the upslope side of the cultivated field to an unnamed tributary to Cedar Creek (**Figure 4**). This unnamed tributary enters Cedar Creek between UT1B and UT1C upstream of the natural valley for UT2. UT2B is currently a field drainage ditch that follows the natural valley for UT2 down to the confluence with UT1C and UT1D. UT2C begins at an existing wetland where flow has been diverted to a small drainage ditch located just west of UT2A. The ditch runs west-east before it is conveyed across a farm path and into the upstream segment of UT2A.

UT3 begins below a pond east of the airport at the perched outlet pipe and is divided into two reaches: UT3A from the pond to the cultivated field, and UT3B from the field to Cedar Creek. This channel has been excavated to the cultivated field and redirected westward along the upper boundary of the field. Old fence lines are evidence of past grazing of livestock along UT3A. A few mature trees of red maple (*Acer rubrum*) and tulip poplar (*Liriodendron tulipifera*) are present, along with many saplings of sweetgum (*Liquidambar styraciflua*). UT3B has been filled and is currently cultivated.

UT4 begins approximately 80 feet north of the right bank of UT1 and flows in a southwesterly direction down to the confluence with UT1 at the reach break between UT1A and UT1B. UT4 has been previously ditched and is bordered by an agricultural field on the right. The left buffer is comprised of a 20 - 30 year old maturing bottomland forest with frequent occurrences of privet.

In general, the tributaries UT2, UT3, and UT4 do not function to their full potential. Having been channelized in the past and ditched to drain nearby field for row crops, the streams do not access their floodplains as often as they naturally would have prior to the farm operations. In some cases, the streams are hydraulically unstable, causing erosion and undercutting of the banks. Habitat along significant portions of the restoration reaches is poor in that there is little woody debris or overhanging vegetation for fish cover or protection for other aquatic species. Vegetative diversity and

habitat diversity is poor along the reaches, as well, and offers little benefit to the wildlife in the area. Site photographs are located in **Appendix 1** and morphological parameters are in **Appendix 4**.

4.2.1 Channel Classification

The streams have been classified as perennial streams using the NCDWQ Stream Identification Form version 4.11 (**Appendix 2**) and are predominantly E5 stream types as classified using the Rosgen stream classification system (Rosgen, 1994). The design reaches have been separated into nine distinct sections that are described in **Section 4.2.3**. Channel characteristics are summarized in **Table 5**.

4.2.2 Discharge

Estimating existing flows (discharge) for the Cedar Creek site is difficult due to the existing network of ditches and channelized streams. Several models, regression equations, and the Coastal Plain regional curves were used to develop existing discharges. Land use and slope were considered when the discharge calculations were developed. All hydraulic and hydrologic analyses are discussed in **Section 7.3**. Data and analysis of the hydrologic and hydraulic models are included as **Appendix 2**.

4.2.3 Channel Morphology

4.2.3.1 UT1 Reach A

UT1 Reach A has a drainage area of 3.29 square miles (2,105 acres), and flows in a westerly direction. The planform of this E-type channel is generally straight and is channelized throughout. The current cross sectional area is 42.1 square feet with approximate dimensions of 18.2 feet wide and 2.3 feet deep. The existing length of Reach A is 713 linear feet, and the dominant bed material is medium to coarse sand. The gradient of the reach is approximately 0.0022 ft/ft. The reach is moderately stable with localized erosion. The riparian buffer along the left bank is a mature bottomland forest and, although the right bank contains mature trees limited to the top of bank, the buffer beyond is dominated by privet. The channel scored 50.0 points on the NCDWQ Stream Identification Form (Version 4.11).

Upstream view ofUT1 Reach C.

4.2.3.2 UT1 Reach B

UT1 Reach B is a slightly oversized perennial channel located in a disturbed, forested corridor. Reach B is approximately 663 linear feet, and flows to the northwest to STA 14+76. It has a drainage area of 3.53 square miles (2,259 acres). UT1 Reach B, an E-type channel, is typically 18.2 feet wide and 2.3 feet deep. The average cross sectional area is approximately 42.1 square feet. The existing slope of Reach B is 0.0022 ft/ft, and the dominant bed material is medium to coarse sand. The channel scored 50.0 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.3 UT1 Reach C

UT1 Reach C is approximately 1,074 linear feet beginning at STA 14+76 and flows northwest to STA 25+50. Reach C has a drainage area of 4.11 square miles (2,630 acres) and has a width and depth of 18.2 feet and 2.3 feet, respectively. The existing cross-sectional area is approximately 42.1 square feet. The existing slope is 0.0022 ft/ft. The buffer consists of a mature bottomland forest on the

left bank; however, the right bank buffer is narrow with cultivated fields adjacent. This reach is classified as an E5 stream type. UT1 Reach C is an incised, channelized, perennial channel. The banks are moderately unstable and lack mature hardwood vegetation along the right bank. The channel scored 50.0 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.4 UT1 Reach D

UT1 Reach D has a drainage area of 4.19 square miles (2,682 acres), and flows from east to west. Reach D begins at STA 25+50 and runs for 1,252 linear feet to STA 38+02. The existing cross-sectional area is approximately 32.2 square feet with a slope of 0.0016 ft/ft. UT1 Reach D is moderately stable and somewhat straight. Cultivated fields are adjacent to or slightly removed from the right channel bank. The left bank consist of a five year old clear-cut and a small area of mature bottomland forest. Spoil is present along the left bank throughout. Remnants of an older abandoned channel are visible behind the spoil. This reach is classified as an E5 stream type and scored 50.0 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.5 UT1 Reach E

UT1 Reach E is a slightly incised but stable channel through a narrow, woody buffer. Similar to Reach D, cultivated fields are present along the right bank. Reach E is approximately 1,548 linear feet, and flows east to west towards Great Coharie Creek. It has a drainage area of 4.52 square miles (2,893 acres). Reach E, an E-type channel, is typically 11.0 feet wide and 2.9 feet deep. The average cross sectional area is approximately 32.2 square feet. The existing slope of Reach E is 0.0016 ft/ft, and the dominant bed material is medium sand. The channel scored 50.0 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.6 UT2 Reach A

UT2 Reach A is a shallow, perennial channel that begins at the confluence of two drainage features. UT2 Reach A has currently been ditched to the edge of a cultivated field along its right bank. This stream reach flows from north to south before being redirected along the upslope side of the cultivated field to an unnamed tributary to Cedar Creek (**Figure 4**). This unnamed tributary enters Cedar Creek between UT1B and UT1C upstream of the natural valley for UT2. The buffer along the left bank includes a mature pine hardwood forest. Reach A is approximately 336 linear feet and has a drainage area of 0.05 square miles (32 acres). This reach is an E-type channel, is typically 4.8 feet wide and 0.5 feet deep. The average cross sectional area is approximately 2.4 square feet. The existing slope of UT2 Reach A is 0.017 ft/ft, and the dominant bed material is medium sand. The channel scored 34.5 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.7 UT2 Reach B

UT2 Reach B begins at an existing farm crossing where UT2 Reach A is redirected into a ditch that flows to the east. This reach is currently a drainage ditch surrounded by cultivated fields and flows from northeast to southwest to the confluence of UT1C. Banks are moderately stable and bedform diversity is low. Bank vegetation for the majority of the reach is limited to herbaceous species due to mowing and plowing along the banks. UT2 Reach B is approximately 397 linear feet, and approximately 12.5 feet wide. It has a drainage area of 0.05 square miles (32 acres).

Downstream view of UT2 Reach B.

4.2.3.8 UT2 Reach C

UT2C is a small drainage ditch located in the middle of the project adjacent to UT2. The upstream end of the reach begins at an existing wetland that borders a farm path to the north. Flow from the wetland has been diverted to a ditch that runs east-west along the farm path before it is conveyed across the path and into UT2 near the upstream end.

4.2.3.9 UT3 Reach A

UT3 Reach A begins below an existing pond east of the airport at the perched outlet pipe and is divided into two reaches UT3A (Upper) and UT3A (Lower). This channel has been excavated to the cultivated field and redirected westward along the upper boundary of the field. UT3A Upper has a drainage area of 0.18 square miles (115 acres) and is approximately 393 linear feet. The upper reach of UT3A is 4.0 feet wide and has a cross sectional area of 3.4 square feet. UT3A Upper has a narrow buffer consisting of tulip poplar, sweetgum, and red maple. Multiple drainage features have been ditched adjacent to UT3A Upper, redirecting flows away from natural drainage patterns. UT3A Lower begins downstream of the drainage ditches, and flows north to south into an excavated ditch adjacent to the cultivated field. Flow is redirected westward along the north side of the field where it runs off the property to the south side of the airport runway. UT3A Lower is approximately 10.4 feet wide and 0.5 feet deep. This reach is relatively straight and has a cross sectional area of 5.5 square feet. The lower reach of UT3A has a narrow buffer along the right bank consisting of few trees. The left bank is similar to the upper reach of UT3A with a diverse mixture of tulip poplar, loblolly pines, red maple and sweetgum. UT3 scored 40.0 points on the NCDWQ Stream Identification Form (Version 4.11).

4.2.3.10 UT3 Reach B

UT3 Reach B is currently a drainage ditch surrounded by cultivated fields on both banks, and flows from north to south to the confluence of UT1E. Banks are moderately stable and bedform diversity is low. Very little bank vegetation is present throughout the reach due to mowing and plowing along the banks. UT3 Reach B is approximately 440 linear feet, and has a top of bank width of 12.0 feet. The current slope of this drainage ditch is 0.011 ft/ft. This reach has a drainage area of 0.23 square miles (147 acres).

4.2.3.11 UT4

UT4 has a drainage area of 0.12 square miles (77 acres), and flows from northeast to southwest into UT1. UT4 begins at STA 0+36 and runs for 78 linear feet to STA 1+14. The existing cross-sectional area is approximately 5.6 square feet with a slope of 0.010 ft/ft. UT4 is a perennial first order stream and is moderately stable although it has been channelized. Cultivated fields are adjacent to the right channel bank with a narrow forested buffer just along the top of bank. The riparian buffer along the left bank is a mature bottomland forest. This reach is classified as an E5 stream type and scored 42.5 points on the NCDWQ Stream Identification Form (Version 4.11).

Table 5. Summary of Existing Channel Characteristics

Reach	Drainage Area (mi^2)	CSA[1] (ft^2)	Width (ft)	Mean Depth (ft)	Width:Depth Ratio	Sinuosity	Slope (ft/ft)
UT1A	3.29	42.1	18.2	2.3	7.9	1.09	0.0022
UT1B	3.53	42.1	18.2	2.3	7.9	1.09	0.0022
UT1C	4.11	42.1	18.2	2.3	7.9	1.09	0.0022
UT1D	4.19	32.2	11.0	2.9	3.8	1.04	0.0016
UT1E	4.52	32.2	11.0	2.9	3.8	1.04	0.0016
UT2A	0.05	2.4	4.8	0.5	9.6	1.08	0.017
UT2B	0.05	---	---	---	---	1.0	0.027
UT2C	0.02	---	---	---	---	---	---
UT3A (upper)	0.18	3.4	4.0	0.9	4.7	1.02	0.016
UT3A (lower)	0.23	5.5	10.4	0.5	19.7	1.02	0.007
UT3B	0.23	---	12.0	---	---	1.0	0.011
UT4	0.12	5.6	6.2	0.9	6.9	1.0	0.010

[1]CSA= cross-sectional area (measured from top of bank)

4.2.4 Channel Stability Assessment

A modified version of the channel stability assessment method (CSA) provided in "Assessing Stream Channel Stability at Bridges in Physiographic Regions" by Johnson (2006) was used to assess channel stability for the Cedar Creek existing channels and reference reach. This method may be rapidly applied on a variety of stream types in different physiographic regions having a range of bed and bank materials.

The original CSA method was designed to evaluate thirteen stability indicators in the field. These parameters are: watershed characteristics, flow habit, channel pattern, entrenchment/channel confinement, bed material, bar development, presence of obstructions/debris jams, bank soil texture and coherence, average bank angle, bank vegetation/protection, bank cutting, mass wasting/bank failure, and upstream distance to bridge. As this method was initially developed to assess stability at bridges, a few minor adjustments were made to remove indicators that contradict stability characteristics of natural channels in favor of providing hydraulic efficiency at bridges. First, the "channel pattern" indicator was altered such that naturally meandering channels scored low as opposed to straightened/engineered channels that are favorable for stability near bridges. Secondly, the last indicator, "upstream distance to bridge," was removed from the assessment as bridges are not a focus of channel stability for this project. Lastly, the "bed material" indicator was removed since all project streams are sand bed channels and would subsequently score high (poorly), as this indicator focuses on coarse substrate. The eleven indicators were then scored in the field, and a rating of excellent, good, fair, or poor was assigned to each project reach based on the total score. (See **Appendix 2** for the CSA field form.)

The CSA results (scores and ratings) for the Cedar Creek project and reference reaches are provided in **Table 6**. UT1, UT2, UT3, and UT4 all received "Fair" ratings, while the Reference Reach received a "Good" rating. Overall, the existing project streams appear to be physically stable as there is little active erosion present; however, all channels have been straightened and entrenched, and some are actively maintained. These characteristics are reflected in the poor CSA scores for channel pattern and bank vegetation/protection.

Table 6. Channel Stability Assessment Results

		UT1 A	UT1 B	UT1 C	UT1 D	UT1 E	UT2 A	UT2 B	UT3A Upper	UT3A Lower	UT3 B	UT4	Reference Reach
1	**Watershed characteristics**	7	7	8	8	8	7	7	7	7	7	7	4
2	**Flow habit**	5	5	5	5	5	4	10	6	6	12	6	2
3	**Channel pattern**	7	7	5	5	7	9	8	10	10	9	7	2
4	**Entrenchment/channel confinement**	4	4	4	3	3	9	6	11	11	4	7	2
5	**Bed material**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	**Bar development**	9	10	10	10	10	10	6	10	9	6	9	3
7	**Obstructions/debris jams**	6	7	6	7	8	9	4	8	7	1	7	5
8	**Bank soil texture and coherence**	8	8	8	8	8	8	9	9	9	9	8	4
9	**Average bank angle**	10	10	10	10	10	10	7	11	11	3	10	4
10	**Bank vegetation/protection**	6	6	6	6	6	8	11	9	9	12	8	5
11	**Bank cutting**	7	7	7	6	6	8	7	10	9	2	7	3
12	**Mass wasting/bank failure**	6	6	7	7	6	7	3	8	8	2	7	2
13	**Upstream distance to bridge**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Score	**75**	**77**	**76**	**75**	**77**	**89**	**78**	**99**	**96**	**67**	**83**	**36**
	Rating*	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Good**

***** Excellent (0 < Score <= 33), Good (33 < Score <= 66), Fair (66 < Score <= 99), Poor (99 < Score <= 132)

4.2.5 Bankfull Verification

Bankfull is difficult and often times impossible to accurately identify on actively maintained channels and agricultural ditches. The usual and preferred indicators rarely exist, and other factors may be taken into consideration in order to approximate a bankfull stage. Other factors that may be used are wrack lines, vegetation lines, scour lines, or top of a bankfull bench; however, complete confidence should not be placed on these indicators. Throughout UT2, UT3, and UT4, the channels are generally entrenched and have been channelized, which means bankfull indicators were very limited or non-existent. Therefore, bankfull stage was estimated by using Coastal Plain Regional Curves and other hydrologic analyses, existing cross-sections, and in-house spreadsheets to estimate bankfull area and bankfull discharge.

4.2.6 Vegetation

Current land use around the project is primarily agriculture and forestry, and immediately to the northwest is the Sampson County Airport. Vegetation within the proposed project area is segmented and discontinuous due to management and past land use. The cultivated fields were most recently soybeans. The landscape in the cultivated areas has been contoured to increase surface runoff and eliminate surface ponding to enhance production and increase mechanized access.

Land use along UT1 is primarily forested on the left bank side and active agriculture on the right bank side, having a narrow or nonexistent wooded buffer adjacent to active cropland. The forested community is predominately young hardwoods. The hardwood species include willow oak (*Quercus phellos*), laurel oak (*Quercus laurifolia*), tulip poplar (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*). Loblolly pine (*Pinus taeda*) is present at higher elevations. A dense

understory is present in many areas, especially along the forest edges. A mid-story layer is comprised of water oak (*Quercus nigra*), tulip poplar, and red maple. Shrubs and woody vines are locally dense and include sweet bay (*Magnolia virginiana*), redbay (*Persea borbonia*), American holly (*Ilex opaca*), wax myrtle (*Morella cerifera*), and swamp greenbriar (*Smilax laurifolia*). Some exotics were noted, including Chinese privet (*Ligustrum sinense*) and Japanese honeysuckle (*Lonicera sempervirens*). The only common herbaceous plant observed is giant cane (*Arundinaria gigantea*). All naturally vegetated areas were classified by their community type, and their boundaries were approximately located on field maps (**Table 7** and **Figure 9**).

UT2 is forested on the left bank and on the right bank a narrow wooded buffer separates the channel from active agricultural field. Woody species are similar to the forest community across UT1. The proposed lower UT2-Reach B is a ditch through an agricultural field.

Vegetation along UT3-Reach A is partially wooded with scattered mature trees and small saplings throughout. The saplings have regenerated since livestock have been removed from the site. Along the valley, trees consist of red maple, tulip poplar, and sweetgum. A few oaks are present in the upper reach below the pond.

UT4 is forested on the left bank. A narrow grassed buffer approximately 5 to 10 feet wide along the right bank separates the channel from an active agricultural field. Woody species are similar to the forest community across UT1.

Some exotics were noted, including Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), wisteria (*Wisteria*), and Japanese honeysuckle (*Lonicera sempervirens*).

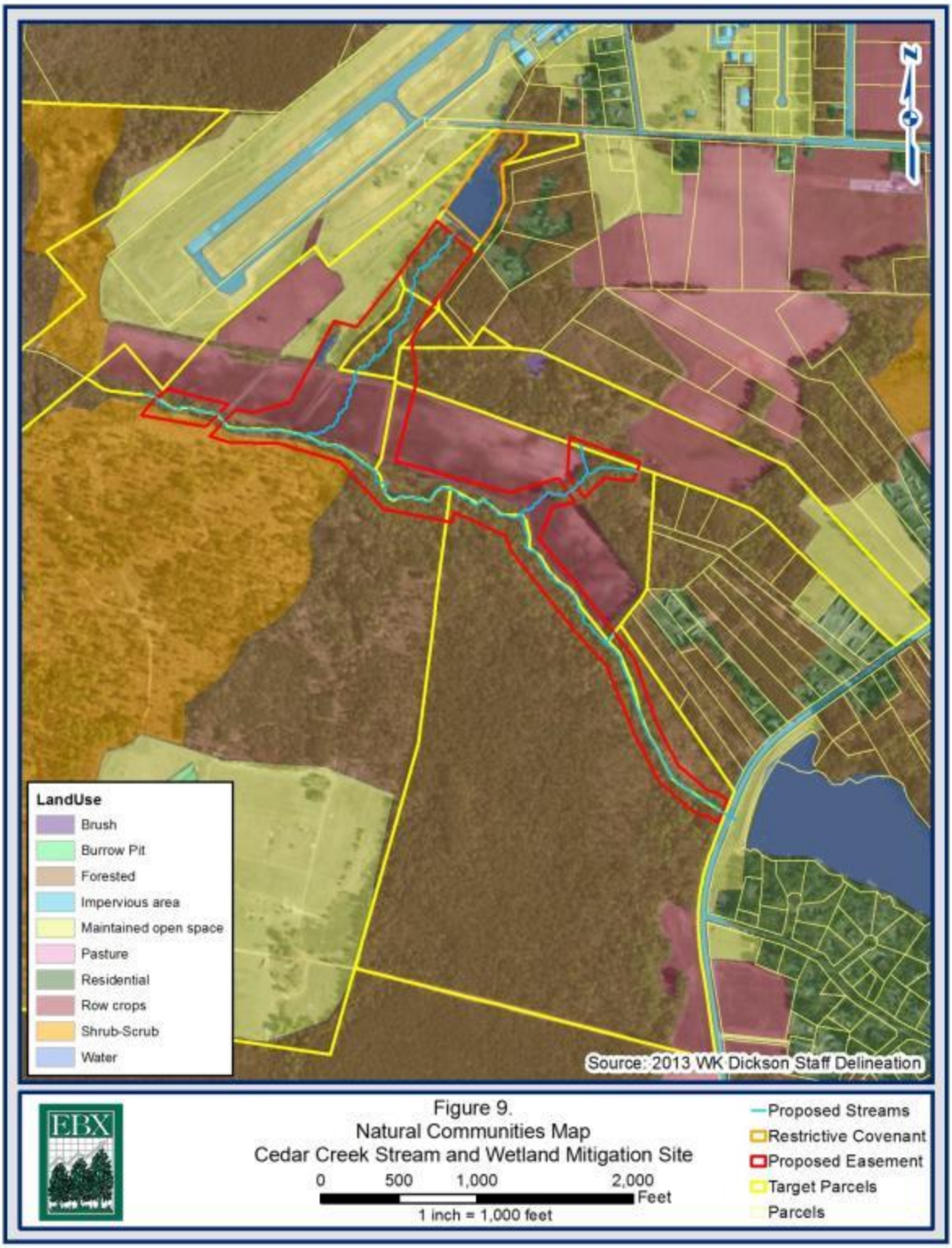
All naturally vegetated areas were classified by their community type, and their boundaries were approximately located on field maps (**Figure 9**). The site is located in the Ecoregion 65-Southeastern Plains. The ecoregion consists of irregular plains having broad interstream divides, and is a mosaic of cropland, pasture, woodland, and forest. Although mapped in level IV Ecoregion 65m (Rolling Coastal Plain), the site is more suited to the nearby level IV Ecoregion 65p (Southeastern Floodplains and Low Terraces). Region 65p is found on the floodplains of major rivers and associated low terraces. Native vegetation is a southern floodplain forest, and includes bottomland hardwood forest (bottomland oaks (*Quercus* sp.)), red maple, sweetgum, green ash (*Fraxinus pennsylvanica*), bitternut hickory (*Carya cordiformis*) and cypress-gum swamp (water tupelo (*Nyssa aquatica*)), swamp tupelo (*Nyssa biflora*), bald cypress (*Taxodium distichum*), pond cypress (*Taxodium ascendens*). Where appropriate, community classification follows Schafale, and Weakley's Classification of the Natural Communities of North Carolina Third Approximation. (Schafale and Weakley 1990).

Detailed observations of vegetation species, soils, and hydrology were recorded in each community type.

Table 7. Natural Community Summary

Natural Community	Percent of Study Area	Schafale and Weakley Community
Maintained Open Space	4.1	NA
Agriculture – Row Crops	28.8	NA
Water	0.6	NA
Mixed Pines/Hardwoods	62.5	Mesic Mixed Hardwood Forest -Coastal Plain Subtype

Natural Community	Percent of Study Area	Schafale and Weakley Community
Shrub-Scrub	4.0	NA


N
LandUse
Brush
Burrow Pit
Forested
Impervious area
Maintained open space
Pasture
Residential
Row crops
Shrub-Scrub
Water
Source: 2013 WK Dickson Staff Delineation
EBX
Figure 9.
Natural Communities Map
Cedar Creek Stream and Wetland Mitigation Site
0 500 1,000 2,000
Feet
1 inch = 1,000 feet
Proposed Streams
Restrictive Covenant
Proposed Easement
Target Parcels
Parcels

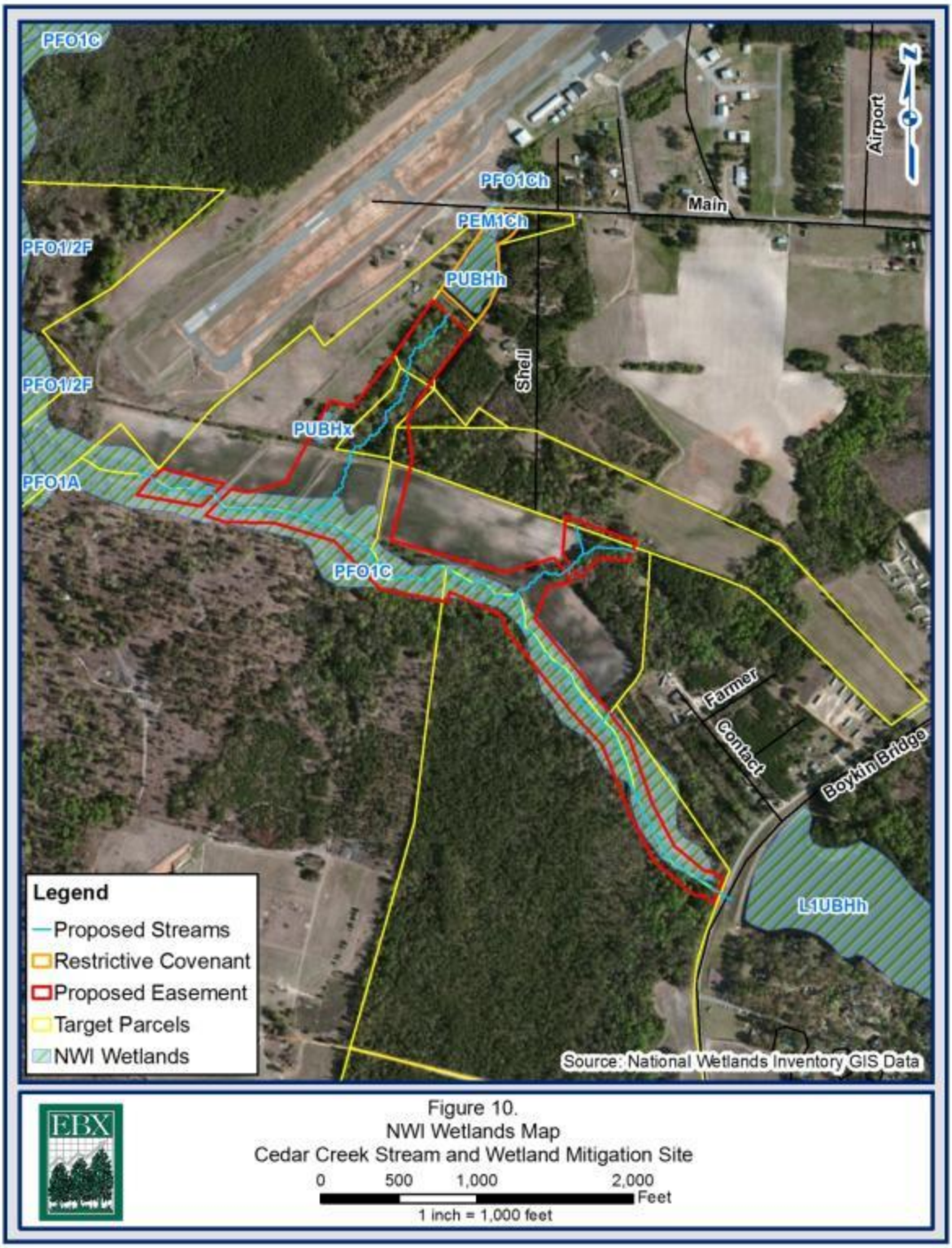
4.3 Wetland Summary Information

4.3.1 Existing Wetlands

The US Fish and Wildlife Service National Wetland Inventory Map (NWI) depicts wetlands on the floodplain along UT1 (**Figure 10**). These wetlands are classified as Palustrine - Forested - Broad-Leaved Deciduous - Seasonally Flooded (PFO1C). A wetland delineation was performed in January, 2013. Wetland boundaries were delineated using current methodology outlined in the 1987 Army Corps of Engineers Wetland Delineation Manual (DOA 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) (U.S. Army Corps of Engineers 2010). Hydric soils were characterized and classified using the Field Indicators of Hydric Soils in the United States, Version 7.0 (USDA-NRCS 2010). Wetland boundaries were marked with sequentially numbered wetland survey tape (pink/black striped). Flag locations were mapped with GPS (**Figure 4**). **Table 8** summarizes the characteristics of the existing wetland.

Table 8. Existing Wetlands Parameters and Characteristics

Parameters	Wetland A
Size of Wetland within Easement (Acres)	2.14
Wetland Type	Riparian
Mapped Soil Series	Bibb and Johnston soils Marvyn loamy sand
Drainage Class	Somewhat poorly Poorly and very poorly
Hydric Soil Status	Yes
Source of Hydrology	Groundwater and flooding
Hydrological Impairment	Ditched / Incised channel
Native Vegetation Community	Cultivated / Disturbed Hardwood Forest
Percent composition of exotic/invasive species	5%


PFO1C
PFO1Ch
PEM1Ch
PFO1/2F
PUBHh
PFO1/2F
PUBHx
PFO1A
PFO1C
Airport
Main
Shell
Farmer
Contact
Boykin Bridge
L1UBHh
Legend
Proposed Streams
Restrictive Covenant
Proposed Easement
Target Parcels
NWI Wetlands
Source: National Wetlands Inventory GIS Data
EBX
Figure 10.
NWI Wetlands Map
Cedar Creek Stream and Wetland Mitigation Site
0 500 1,000 2,000
Feet
1 inch = 1,000 feet

4.3.1.1 Wetland A

The existing wetland is located along the floodplain of UT1. The current land use is disturbed hardwood forest. Dominant plant species include tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), blackgum (*Nyssa sylvatica*), gray inkberry (*Ilex glabra*), sweetbay (*Magnolia virginiana*), American holly (*Ilex opaca*), American beech (*Fagus grandifolia*), redbay (*Persea borbonia*), highbush blueberry (*Vaccinium corymbosum*), Chinese privet (*Ligustrum sinense*), ironwood (*Carpinus caroliniana*), woolgrass (*Scirpus cyperinus*), muscadine (*Vitis rotundifolia*), roundleaf greenbrier (*Smilax rotundifolia*), Nepalese browntop (*Microstegium vimineum*), and giant cane (*Arundinaria gigantea*). The primary source of hydrology is slope seepage above the floodplain. A jurisdictional determination of the wetland has been made by the US Army Corps of Engineers (USACE), and is included in **Appendix 2**. Wetland forms are also included in **Appendix 2**.

4.3.2 Existing Hydric Soil

A series of soil borings were used to describe and verify presence of hydric soils across the site, and a hydric soil boundary was delineated containing hydric soil having potential for restoration. The detailed soil investigation of the site verified the existence of sandy soils similar to the Bibb and Johnston soils throughout the lower landscape.

Using criteria based on "Field Indicators of Hydric Soils in the United States, Version 7.0" (USDA, NRCS, 2010), 20.3 acres were initially identified that show hydric characteristics within the project area. These soils have a thick black sandy or loamy surface (7.5 YR 2.5/1) underlain by black or dark brown sandy textured subsoil. Mottles of brown or black are found in some subsoils. A few areas are underlain by a clayey textured material. These black horizons extend to 20 inches or deeper. These hydric soils occupy the lowest part of the landscape, along tributaries, and are often located near the current ditch system. These soils will become restored wetlands once hydrology is returned to the site. In the higher landscapes and shallow slopes, soils have a black or dark brown sandy surface and are underlain by a brown or sandy loam or loamy sand. A few areas have a sandy clay loam or sandy clay that functions as a restricted horizon to vertical flow. Much of the proposed area has been manipulated by ditching and crowning for drainage. Fill was identified in one area of the cultivated field and along the excavated UT2A channel.

Many characteristics of the soils in this area are related strongly to landscape position and small changes in topography. The topography influences characteristics such as organic content, depth to water table, duration of saturation, and, to a variable extent, soil texture in alluvial materials. Much of the site has been disturbed by land use, including cultivation, grazing, and mechanical earth movement.

4.3.2.1 Proposed Wetland

This wetland is located along the entire length of UT3, and extending along UT1 approximately 600 linear feet to either side of the confluence of UT1 and UT3. The current land use is row crop production along the lower end of UT3, and disturbed mixed hardwood forest along UT1 and the upper end of UT3. Ditches are present, and a farm road bisects the proposed wetland area. Characteristics of the proposed wetland are summarized in **Table 9**.

Table 9. Proposed Hydric Soils Parameters and Characteristics

Parameters	Wetland 1
Size of Wetland within Easement (Acres)	13.1
Proposed Wetland Type	Riparian Riverine
Mapped Soil Series	Gold Johns fine sandy loam Bibb and Johnston soils
Drainage Class	Somewhat poorly Poorly and very poorly
Hydric Soil Status	Yes Yes
Source of Hydrology	Groundwater and flooding
Hydrological Impairment	Ditched/Incised channel
Native Vegetation Community	Cultivated
Percent composition of exotic/invasive species	5%

The areas of existing hydric soils have been historically disturbed and lack the typical vegetation of hardwood wetlands. Disturbance includes clearing and grubbing, cultivation, ditching, and crowning. This area of hydric soil is proposed for wetland restoration. The proposed wetland restoration area is cultivated row crop and is effectively drained.

4.4 Regulatory Considerations and Potential Constraints

4.4.1 Property Ownership, Boundary, and Utilities

The project is located within the central business district of the City of Clinton, and the area surrounding the project is primarily agricultural and silvicultural. There are no constraints to increasing stream bed elevations at the Cedar Creek Mitigation Site. One crossing will be upgraded or constructed by the landowner to provide full landowner access to isolated properties across UT1 Reach E. One additional crossing will be added near the middle of UT2 to provide the landowner continued access to the adjacent agricultural fields. A full 50-foot riparian buffer will either be restored or enhanced along all project streams. The Cedar Creek site is located within five hundred feet of an air transport facility (Sampson County Airport). A letter dated May 17, 2012 from the NCDOT Division of Aviation supports that the proposed restoration does not create additional obstructions in the airport approach and improves the current situation with respect to wildlife hazard attraction. The letter also stipulated that the design and implementation not encourage beaver habitat and provide an agreement to included general wildlife hazard management.

4.4.2 Site Access

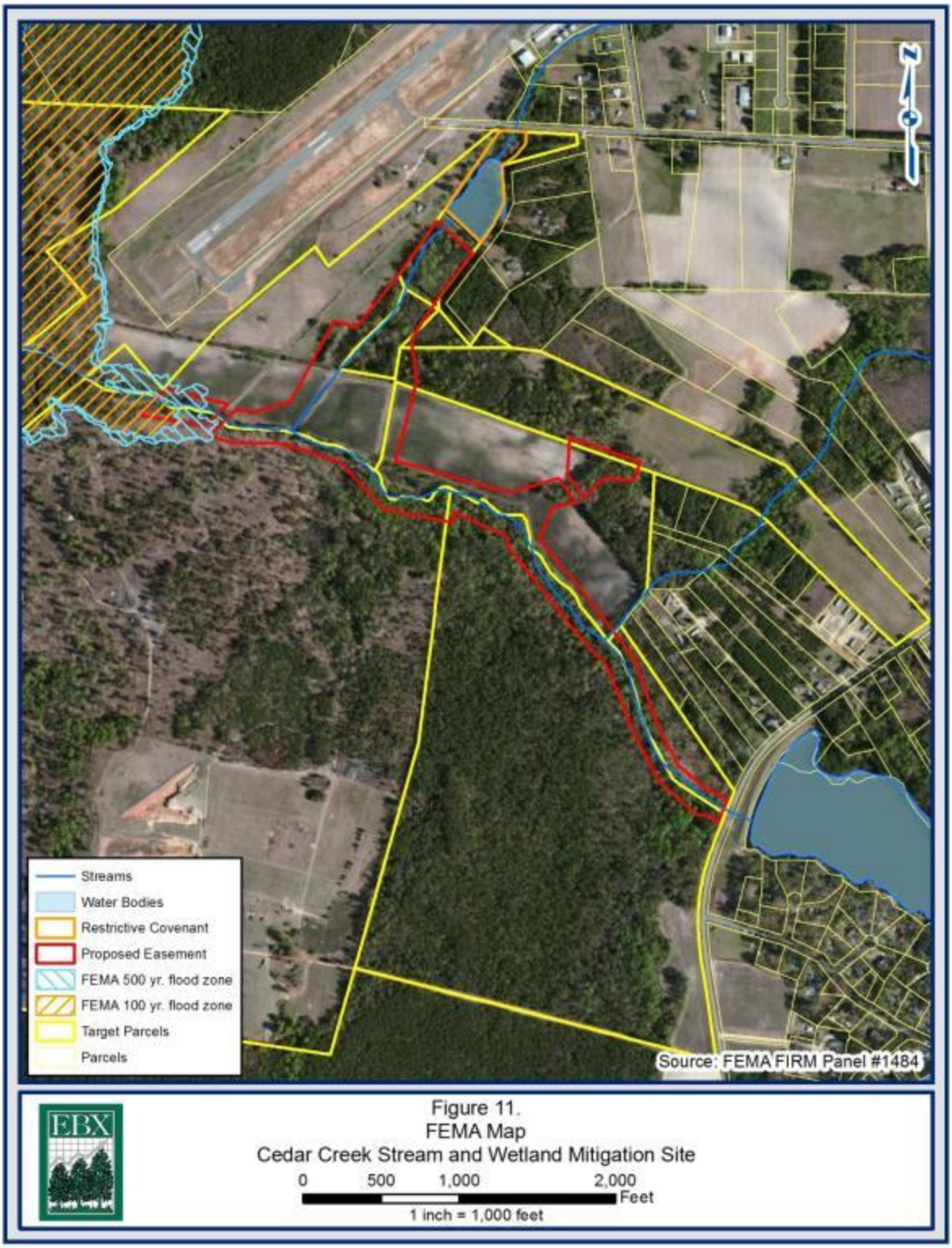
There are no access constraints to the Cedar Creek site prior to and during construction. To access the Site from the town of Clinton, travel west on Highway 24 (Sunset Avenue), take a left onto Airport Road and go 1.3 miles. Turn right onto West Main Street Extension, go 0.25 miles, and turn left onto dirt farm path across from Sampson Airport Road. Follow the path across the field to the wood line. Continue along the wood line to the bottom of the field where the path enters the woods on the right. The path opens up into fields along Cedar Creek and just west of UT3. Keeping to the left will take you to UT3 and down to UT1 Reach B/C. Going to the right will take you across UT3. UT1 flows along the lower edge of this field. For future permanent access, the Site will be accessed directly from Boykin Bridge Road.

4.4.3 FEMA/ Hydrologic Trespass

There are no hydrologic constraints to the proposed Cedar Creek project. While designing the project, appropriate measures were taken to reduce the chances of hydrologic trespass of the adjacent agricultural fields. The adjacent land use will not be affected by the proposed design, and the property owners have been notified of any potential impacts from hydrologic trespass within existing ditches. No detrimental impacts are expected beyond the easement limits. The Cedar Creek Restoration Site is outside of any FEMA floodway area (**Figure 11**). However, the most downstream section of UT1 (approximately 169 linear feet) is mapped as Zone AE, and has a one percent annual chance of flooding. UT1 is also mapped as Zone X (0.2 percent annual chance of flooding) for approximately 170 linear feet upstream of the area mapped Zone AE. It is anticipated that neither a no-rise nor a Conditional Letter of Map Revision (CLOMR) will be required as there are no proposed grading activities along UT1 that occur within either Zone AE or Zone X. FEMA and other regulatory considerations are summarized in **Table 10**.

Table 10. Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States - Section 404	Yes	No	Appendix 3
Waters of the United States - Section 401	Yes	No	Appendix 3
Endangered Species Act	Yes	Yes	Section 4.1.4; Appendix 3
Historic Preservation Act	Yes	Yes	Section 4.1.5; Appendix 3
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	Yes	No	Section 4.4.3; Appendix 3
Essential Fisheries Habitat	No	N/A	N/A


N
Streams
Water Bodies
Restrictive Covenant
Proposed Easement
FEMA 500 yr. flood zone
FEMA 100 yr. flood zone
Target Parcels
Parcels
Source: FEMA FIRM Panel #1484
EBX
Figure 11.
FEMA Map
Cedar Creek Stream and Wetland Mitigation Site
0
500
1,000
2,000
Feet
1 inch = 1,000 feet

5 DETERMINATION OF CREDITS

Mitigation credits presented in **Tables 11-13** are projections based upon site design. Upon completion of site construction, the project components and credits data will be revised to be consistent with the as-built condition.

Table 11. Determination of Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	2,943	2,287	17.3	NA	NA	NA	NA	NA	NA

Table 12. Project Components

Project Component or Reach ID	Stationing/ Location	Existing Footage or Acreage	Approach (PI, PII, etc.)	Restoration or Restoration Equivalent	Restoration (R) or Restoration Equivalent (RE)	Mitigation Ratio	SMUs/WMUs
STREAM							
UT1	1+01 to 31+65	3,064	Enhancement II	RE	3,064	1 : 2.5	1,226
UT1	31+65 to 35+80	415	Enhancement I	RE	415	1 : 1.5	277
UT1	35+80 to 41+95	615	Enhancement II	RE	615	1 : 2.5	246
UT1	41+95 to 44+60	265	Enhancement I	RE	265	1 : 1.5	177
UT1	44+60 to 53+51	891	Enhancement II	RE	827	1 : 2.5	331
UT2	0+11 to 3+48	364	Headwater Valley	R	337	1 : 1.0	337
UT2	3+48 to 9+12	587	P1 Restoration	R	504	1 : 1.0	504
UT2-C	0+02 to 1+92	NA	Headwater Valley	R	190	1 : 1.0	190
UT3	0+60 to 19+72	1,428	P1 Restoration	R	1,912	1 : 1.0	1,912
UT4	0+36 to 1+14	78	Enhacement II	RE	78	1 : 2.5	31
WETLAND							
W1	Adjacent to UT3 & UT1	17.30	Restoration	R	13.10	1 : 1.0	13.1

Table 13. Component Summation

Restoration Level	Stream (LF)	Riparian Wetland (Acres)		Non-Riparian Wetland (Acres)	Buffer (ft^2)	Upland (Acres)
		Riverine	Non-Riverine			
Restoration	2,416	17.30				
Headwater Valley	527					
Enhancement						
Enhancement I	680					
Enhancement II	4,584					
Creation						
Preservation						
High Quality Preservation						

6 CREDIT RELEASE SCHEDULE

All credit releases will be based on the total credit 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 in **Tables 14** and **15**.

Table 14. Stream Credits

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% (65%*)
3	Third year monitoring report demonstrates performance standards are being met.	10%	60% (75%*)
4	Fourth year monitoring report demonstrates performance standards are being met.	10%	70% (85%*)
5	Fifth year monitoring report demonstrates performance standards are being met.	10%	80%
6	Sixth year monitoring report demonstrates performance standards are being met.	10%	90%
7	Seventh year monitoring report demonstrates performance standards are being met, and project has received close-out approval.	10%	100%

*additional 15% credit release following second bankfull event in separate years

Table 15. Wetland Credits

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%
3	Third year monitoring report demonstrates performance standards are being met.	10%	60%
4	Fourth year monitoring report demonstrates performance standards are being met.	10%	70%
5	Fifth year monitoring report demonstrates performance standards are being met. Provided that all performance standards are met, the IRT may allow NCEEP to discontinue hydrologic monitoring after the fifth year, but vegetation monitoring must continue for an additional two years for a total of seven years.	10%	80%
6	Sixth year monitoring report demonstrates performance standards are being met.	10%	90%
7	Seventh year monitoring report demonstrates performance standards are being met, and project has received close-out approval.	10%	100%

6.1 Initial Allocation of Released Credits

The initial allocation of released credits, as specified in the mitigation plan, can be released by the NCEEP 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 NCEEP 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.

6.2 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 15% of a site's total stream credits shall be released after two bank-full 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 bank-full 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 NCEEP 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.

7 MITIGATION WORK PLAN

7.1 Reference Stream Studies

7.1.1 Target Reference Conditions

The restoration site is characterized by agricultural and forestry practices. Several ditches and underdrains exist in the watershed and contribute to the project site. Physical parameters of the site were used, as well as other reference materials, to determine the target stream type. An iterative process was used to develop the final information for the site design.

To develop the target reference conditions, physical site parameters were reviewed. This included the drainage area, land use, soils mapping units from the Sampson County Soil Survey for the watershed and site, typical woody debris and habitat available and for the area, as well as general topography. The "Classification of the Natural Communities of North Carolina" was also used to narrow the potential community types that would have existed at the site (Shafale and Weakley, 2003).

Targeted reference conditions included the following:

- Located within the Physiographic Region – Outer Coastal Plain,
- Similar drainage area,
- Similar land use onsite and in the watershed,
- Similar watershed soil types,
- Similar site soil types,

- Ideal, undisturbed habitat – several types of woody debris present,
- Similar topography,
- Similar slope,
- Pattern common among coastal plain streams, and
- Minimal presence of invasive species.

7.1.1.1 Reference Site Search Methodology

All the parameters used in **Section 2.2** were used to find appropriate reference stream sites. Obtaining property owner information and owner authorization for access was another factor in locating suitable reference sites for the project. For this project, there was no predetermined amount of reference sites needed as long as the site was suitable and met nearly all the parameters. Several potential reference sites were assessed, and their characteristics were noted. It is difficult to find reference sites on the coastal plain because many have been disturbed by farming or urban development. Most streams tend to be modified ditches and may have some of the characteristics that are sought in a reference reach, but too few to make it an ideal reference for the project site. One reference stream site that proves to be ideal in both geomorphology and habitat is located at the upstream southeast section of the restoration site in a wooded corridor. The reference stream reach flows into UT1 from the south side just downstream of Boykin Bridge Road.

A GIS-based search was initially conducted for the identification of reference stream sites in the outer coastal plain. The GIS process was based on a search through quadrangle maps, aerial photography, and topography. Drainage areas for each reference site were delineated. Soils and land use were considered for each site, as well as accessibility and location in comparison to the restoration reach. Once sites were identified, all sites were visited and assessed. Many of the references were affected by farming practices, dense invasive species, and disturbed or altered floodplains along the streams. This was the case for a few of the sites visited, and, therefore, the sites were not considered. One site was identified for use as a reference site.

7.1.1.2 Reference Watershed Characterization

The reference stream flows northwest and drains into UT1 of the Cedar Creek project (**Figure 12**). The reach that was surveyed and analyzed is approximately 300 feet long. The drainage area for the unnamed tributary to UT1 is 0.13 square miles (81 acres). The land use in the watershed is characterized by evergreen forest (47 percent), cultivation (31 percent), woody wetlands (9 percent), open space (8 percent) and shrub/scrub (5 percent). Site photographs of the reference stream are located in **Appendix 1**.

The current State classification for the reference stream is undefined. However, Great Coharie Creek is defined as Class C S*w* (NCDWQ, 2012). Class C waters are suitable for aquatic life, secondary recreation, fishing, fish consumption and wildlife. The *Sw* is a designation for swamp waters—waters that have low velocities and other natural characteristics that are different from adjacent streams. Using Rosgen stream classification, the stream is classified as an E/C5 stream type.

7.1.1.3 Reference Soils Characterization

The soils found in and around the reference reach are mapped as Marvyn, Bibb and Johnston soils. Marvyn loamy sand (MaC), 6 to 12 percent slopes is mapped on the upper portion of the reference reach. This unit is a well-drained soil along the side slopes of major drainages. They have moderate permeability and runoff is medium. This soil unit is used for woodland, pasture, and forage crops, but is poorly suited to row crops due to slope, surface runoff, and potential for erosion. The depth to seasonal high water table is greater than six feet. It has clayey subsoil. Marvyn soil is not considered

hydric by the NRCS when undrained. Bibb and Johnston soils (BH), which are frequently flooded soils are mapped on the lower section of the reference reach stream. This map unit is typically made up of about 45 percent poorly drained Bibb soil and 35 percent very poorly drained Johnston soil. They are commonly flooded and runoff is very slow. This soil formed in loamy and sandy fluvial sediments on the floodplain of major stream systems. Bibb and Johnston soils have moderate to moderately rapid permeability when the water table is low. The seasonal high water table is at or near the surface for several months. The Johnston soil has a high organic matter content. This soil unit is poorly suited to crops due to the lack of a suitable outlet for drainage systems. Wetness and flooding are the main limitation to development. This soil is considered to be hydric by the NRCS. The two soil series mapped at the reference reach site are also located at the Cedar Creek Restoration Site.

7.1.1.4 Reference Discharge

Several hydrologic models/methods were used to develop a bankfull discharge for the reference site. Existing drainage area, land use, slope, roughness, and cross-sectional area were all factors considered when performing the calculations. Using a combination of Coastal Plain Regional Curves, in-house spreadsheet tools, and a project specific regional flood frequency analysis, the existing discharge was found to be around five cubic feet per second (ft^3/s). See **Section 7.3.1.1** for a more detailed description of the hydrologic analyses performed for this project.

7.1.1.5 Reference Channel Morphology

In comparison to the restoration reaches, the reference reach dimensions are similar in size or slightly larger than the dimensions required for the design (pattern, dimension and profile) of the restoration reaches. Therefore, a scaling factor is used to either increase or decrease the dimensions as needed for the design, such that the proposed channel will be able to convey the design discharge. The stream was typically 5.5 to 8 feet wide and around 1 foot deep. The cross sectional area was typically around 3.5 to 4.0 square feet with a width to depth ratio around 7 to 12.

7.1.1.6 Reference Channel Stability Assessment

The reference reach was stable and showed no evidence of incision or erosion in the portion that was surveyed and analyzed. The stream appeared to maintain its slope and had sufficient amounts of vegetation to secure its banks. Riparian buffer widths exceeded fifty feet on each side. The CSA results (scores and ratings) for the reference reach are provided above in **Table 6 (Section 4.2.4**). The reference reach received a "Good" rating as the channel demonstrates a stable meandering pattern and a well vegetated riparian buffer.


Shel
Farmer
Contact
Reference Reach
Drainage Area:
0.13 acres
Scott
Wright
Boykin
Sprunt
Boykin Bridge
N
EBX
Figure 12.
Reference Reach Map
Cedar Creek Stream and Wetland Mitigation Site
0 500 1,000 2,000
Feet
1 inch = 1,000 feet
Legend
Existing Streams
2-ft Contours
Proposed Easement
Drainage Area

7.1.1.7 Reference Bankfull Verification

Typical indicators of bankfull include vegetation at the bankfull elevation, scour lines, wrack lines, vegetation lines, benches/inner berm, and point bars. Throughout the entire length of the reference reach, bankfull is located at the top of bank elevation. The accuracy of this bankfull stage is verified by the Coastal Plain Regional Curves using existing cross sections to calculate area and discharge. Evidence that can further support the location of bankfull is the lack of any bench or berm features within the channel, and wrack lines present within the floodplain.

7.1.1.8 Reference Vegetation

The reference reach riparian community is characteristic of a coastal plain small stream swamp community. This community is approximately 50 to 60 years old. The reference reach buffer corridor is a bottomland hardwood forest. Areas on higher elevations have scattered loblolly pine (*Pinus tadea*), red maple, and red oak (*Quercus falcate*). Within the lower and wetter areas, hardwood species are common. These species include black gum (*Nyssa biflora*) sweet gum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), and willow oak (*Quercus phellos*). Most of the canopy species recorded are high dispersal species and have been observed to occur near the restoration site. The current landowner at the Cedar Creek Site has also stated that Atlantic white cedar (*Chamaecyparis thyoides*) is historically native along the floodplains of Cedar Creek. Few Atlantic white cedar trees were noted; however, the ones that were observed appeared to be dead or dying.

It is anticipated that a local seed source for the high dispersal species is present and will disperse across much of the mitigation site. These species are often found in early successional communities and quickly fill disturbance gaps. Because many of these high dispersal species often become aggressive in mitigation sites, they are not included in the Restoration Planting List (**Section 7.2.3**). Hardwood species typical of the target community were observed in adjacent and nearby communities, and were judged to be more appropriate for this site.

7.1.2 Reference Wetland Studies

A reference wetland was evaluated on the left bank (south) of UT1 for natural community species composition. Groundwater monitoring gauges will be installed in the reference wetland at the baseline monitoring stage for comparison with the restored wetland area.

7.2 Design Parameters

7.2.1 Stream Restoration Approach

Stream restoration efforts along the unnamed tributaries to Great Coharie Creek were accomplished through analyses of geomorphic conditions and watershed characteristics. The design approach applies a combination of analytical and reference and/or analog reach based design methods that meet objectives commensurate with both ecological and geomorphic improvements. Proposed treatment activities may range from minor bank grading and planting to re-establishing stable planform and hydraulic geometry. For reaches requiring full restoration, natural design concepts have been applied and verified through rigorous engineering analyses and modeling. The objective of this approach is to design a geomorphically stable channel that provides habitat improvements and ties into the existing landscape.

The Cedar Creek Site will include Priority Level I stream restoration, headwater valley restoration, stream Enhancement Levels I and II, and stream buffers throughout the project site will be restored and protected in perpetuity. Priority Level I stream restoration will incorporate the design of a single-thread meandering channel, with parameters based on data taken from the reference site described in

Section 7.1 above, published empirical relationships, NC Coastal Plains Regional Curve tables, and hydrologic and hydraulic analyses. Approximately 2,416 linear feet of stream channel will be reconstructed. Headwater valley restoration will be applied to 527 linear feet of channel. Enhancement Level I will be applied to 680 linear feet of channel that requires buffer enhancement, bank stabilization and habitat improvements. Enhancement Level II will be applied to an additional 4,584 linear feet of channel that requires buffer enhancement and/or minimal bank and habitat improvements. The conceptual plan view is provided in **Figure 13**.

Current stream conditions along the proposed restoration reaches demonstrate significant habitat degradation as a result of impacts channelization performed to promote agricultural activities. Additionally, the riparian buffer is in poor condition throughout much of the project area surrounding the restoration reaches. Much of the riparian buffer is devoid of trees or shrubs and active pasture and/or crops are present up to the edge of the existing channel.

The Cedar Creek Site design approach began with a thorough study of existing conditions, including the onsite streams and ditches, valleys, and watershed. Design parameters, including active channel, habitat and floodplain features were developed from analyses performed at the reference site. Analytical design techniques were used to determine the design discharge and to verify the design as a whole.

Engineering analyses were performed using various hydrologic and hydraulic models to verify the reference reach based design. A combination of methods (including Hydraflow Hydrographs, regional curves and flood frequency analysis) were used to calculate flows received by the channel for bankfull and other significant storm events. HEC-RAS was then used to simulate water surface elevations of flows generated by the hydrologic analysis. The development of the HEC models is an important component to the design; therefore, model input parameters are field verified when possible. Through this hydrologic analysis, the design discharge (typically referenced as bankfull or dominant discharge) was determined, and the subsequent design was based on this calculated discharge. Design parameters developed through the analyses of reference reach data and hydrologic and hydraulic modeling were confirmed using the Stable Channel Design function components within HEC-RAS and through spreadsheet tools.

Engineering analyses were performed concurrently to geomorphic and habitat studies. While the stream design was verified by simulations of hydrology and fluvial processes, desirable habitat features were derived from reference sites and project streams and were integrated into the project design. This process provides a natural channel design that addresses aquatic function improvements in addition to stability. Both riparian habitat features and in-stream structures such as log grade controls, log drop structures, and log toes were used throughout the project to act as grade control and for bank stabilization by dissipating and redirecting the stream's energy. Bank stability will also be enhanced through the installation of cuttings bundles and live stakes that include native species (e.g. black willow (*Salix nigra*) and silky dogwood (*Cornus amomum*)).

Sections of abandoned stream channel will be backfilled to the elevation of the floodplain in areas adjacent to the new channel with material excavated onsite and by installing channel plugs where necessary. The floodplain will be planted with native species creating a vegetated buffer, which will provide numerous water quality and ecological benefits. Stream banks will be stabilized using a combination of grading, erosion control matting, bare-root plantings, structure placement, and sod transplants where possible. The stream and adjacent riparian areas will be protected by a minimum 50-foot permanent conservation easement.

When all of these components are combined, a functional and stable channel with diverse habitat will be restored. According to Stream Mitigation Guidelines (2003) published by the US Army Corps of Engineers, the US Environmental Protection Agency, The North Carolina Wildlife Resources Commission, and the NCDWQ, the proposed restoration design will meet the guidelines of stream restoration and will be subject to a mitigation ratio of 1:1.

Throughout the project area, there will be several breaks within the conservation easement where stream credits will not be generated to account for 60-foot farm crossings. Along UT1, one existing crossing will remain in place and is scheduled to be removed and replaced at a later date. Along UT2, a culvert crossing will be installed at an existing path crossing near the middle of the reach.

Cedar Creek has been broken into the following design reaches:

- **UT1 (STA 1+01 to STA 53+51)** –UT1 flows from southeast to northwest across the project, totaling 5,186 linear feet of Enhancement Level I and II. The upper-most portion of UT1 (reaches UT1A and UT1B) is stable and has a forested buffer along both banks; however, privet is dominant within the right buffer. The downstream portion of UT1 (reaches UT1C, UTD and UT1E) is moderately stable and exhibits some areas of localized erosion. The buffer along this section consists of a five year old clear-cut along the left bank and cultivated fields along the right bank. A 60-foot easement break is proposed within this downstream section to account for an existing farm crossing. Approximately 680 linear feet of Enhancement Level I is proposed along reaches UT1C, UT1D, and UT1E. Selective locations have been identified to include streambed structures, minor bank grading, planting a native stream buffer and invasive species control. Primarily, Stabilization/Enhancement II activities will include performing minor bank grading, planting the buffer with native vegetation, and invasive species control.

- **UT2 (STA 0+11 to STA 9+12)** –UT2 is the middle tributary of the project, totaling 337 linear feet of headwater valley restoration along the upstream section and 504 linear feet of Priority 1 restoration through the downstream section. The upper section of the channel has been channelized and is bordered by cultivated fields to the northwest and a pine stand to the southeast, while the lower portion is a small ditch surrounded by cultivated fields. The headwater valley portion will relocate the flowpath to the natural valley (to the left of the existing ditch), and the abandoned ditch will be filled. The proposed P1 restoration will relocate the channel to either side of its current location to follow the natural valley, and will outlet into Cedar Creek near STA 25+50. A 60-foot easement break is proposed near the middle of the reach to allow for the installation of a culvert crossing. Restoration activities will involve constructing a meandering channel, installing habitat and drop structures, filling and plugging the abandoned channel, planting the buffer with native vegetation, and invasive species control.

- **UT2C (STA 0+02 to STA 1+92)** –UT2C is located in the middle of the project (adjacent to UT2), totaling 190 linear feet of headwater valley restoration. The upstream end of the reach begins at an existing wetland that borders a farm path to the north. Flow from the wetland has been diverted to a ditch that runs east-west along the farm path before it is conveyed across the path and into UT2 near the upstream end. Restoration will involve redirecting channel flow to the natural valley and grading out the existing ditch and path such that the area matches existing grade on either side of the path. Additional activities include planting the buffer with native vegetation and invasive species control.

- **UT3 (STA 0+60 to STA 19+72)** –UT3 is the western most tributary of the project, totaling 1,912 linear feet of Priority 1 restoration. The upper section of the channel is incised/oversized and begins at a pond outlet east of the airport and flows through a wooded area consisting of saplings and some mature hardwoods, while the lower section flows through a cultivated field. The proposed channel will be relocated to the west to follow the natural valley, and will flow through the middle of proposed wetland W1. UT3 will outlet into Cedar Creek near STA 43+10. Restoration will include constructing a meandering channel, installing habitat and grade control structures, filling and plugging the abandoned channel, planting the buffer with native vegetation, and invasive species control. Small ditches located adjacent to UT3 and within the conservation easement will also be plugged and filled to redirect and diffuse flow through the proposed wetland and/or into UT3.

- **UT4 (STA 0+36 to STA 1+14)** –UT4 is the eastern most tributary of the project, totaling 78 linear feet of Enhancement Level II. The reach is relatively stable, but has been historically channelized. The buffer along this section consists of an agricultural field along the right bank, and a forested buffer along the left bank; however, privet is common within the left buffer. Stabilization/Enhancement II activities will include performing minor bank grading, cutting a floodplain bench, and planting the buffer with native vegetation, and invasive species control.

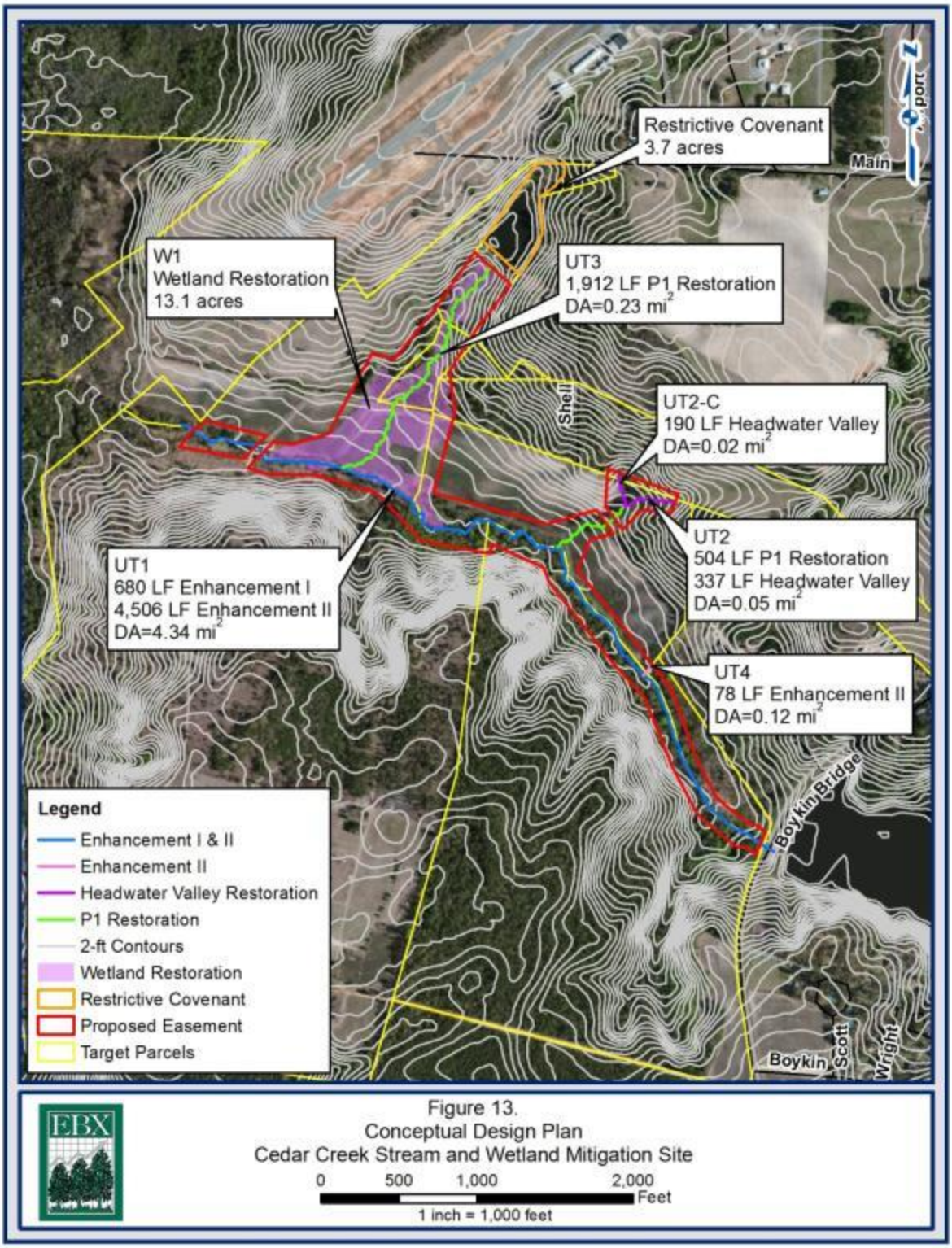


Figure 13.
Conceptual Design Plan
Cedar Creek Stream and Wetland Mitigation Site

7.2.1.1 Design Discharge

Based upon the hydrologic analysis described above, design discharges were selected that fall on the low end of flows between the results of the 1.1 and 1.5-year flood frequency analysis for each restoration reach. The selected flows are $4ft^3/s$ and $6ft^3/s$ for UT2 and UT3, respectively. These discharges will provide frequent inundation of the adjacent floodplain.

The design discharges were selected based on the following rationale:

- The calculated bankfull discharge for the analog/reference reach closely matches the results of the 1.1-year flood frequency analysis,
- The results of the Hydraflow Hydrographs for the 1-year storm fell between the results of the 1.1 and 1.5-year flood frequency analysis,
- Selecting design discharges between the 1.1 and 1.5-year storm events allows frequent inundation of the floodplain and any adjacent wetlands.

7.2.1.2 Design Methods

There are three primary methods that have demonstrated success in stream restoration: analog, empirical, and analytical. All three methods have advantages and limitations, and it is often best to utilize more than one method to address site-specific conditions or to verify the applicability of design elements. This is particularly true in developed watersheds where existing conditions do not always reflect current inputs and events, and sediment and hydrologic inputs may remain unstable for some time. Combinations of analytical and analog methods were used to develop the stream designs for Cedar Creek.

Analytical Approach
Analytical design is based on principles and processes considered universal to all streams, and can entail many traditional engineering techniques. The analytical approach utilizes continuity, roughness equations, hydrologic and hydraulic models, and sediment transport functions to derive equilibrium conditions. Since the project is located within a rural watershed, restoration designs are based on hydrologic and hydraulic analyses, including rainfall-runoff models to determine design discharges coupled with reference reach techniques.

Analog Approach
The analog method of natural channel design involves the use of a "template" or reference stream located near the design reach, and is particularly useful when watershed and boundary conditions are similar between the design and analog reaches (Skidmore et al., 2001). In an analog approach, the planform pattern, cross-sectional shape, longitudinal profile, and frequency and locations of woody debris along the analog reaches are mimicked when developing the design parameters for the subject stream. A scaling factor was calculated from the survey data in order to correctly size the planform design parameters for the project site. The scaling factors for each design reach were derived from the design cross-sectional area and topwidth of each reach as follows:

1. The appropriate bankfull cross-sectional area (CSA) of each design reach was calculated using an in-house spreadsheet based on Manning's Equation. The input parameters included the design discharge as determined by the hydrologic analysis described above, and proposed slope based on site conditions and the sinuosity measured for the analog reach.

2. The cross-sectional shape was adjusted within the spreadsheet to replicate the width-depth ratios and side slopes surveyed along the analog reach, while also maintaining the CSA necessary to convey the design discharge.

3. The scaling factor is determined from the ratio of the design topwidth to the analog topwidth (**Table 15**). For this project, several sections and planform geometry were obtained at the analog site, resulting in an average width of 7.8 feet.

4. Pool cross-sectional areas were calculated using both typical reference reach techniques and the analog approach. Design CSA areas were determined using the measured analog ratios of shallow CSA to pool CSA as applied to the design CSAs. The pool cross-sectional shape was adjusted within the in-house spreadsheet as described above in step 2.

Table 15. Scaling Factors for Sizing Planform Design Parameters

Reach	Drainage Area (ac)	Proposed Bankfull CSA (ft^2)	Design Topwidth (ft)	Analog Reach Topwidth (ft)	Scaling Factor
UT2	35	2.2	4.6	6	0.8
UT3	151	3.6	6	6	1.0

7.2.1.3 Typical Design Sections

Typical cross sections for shallows and pools are shown on the design plan sheets in **Appendix D**. The cross-section dimensions were developed for the three design reaches by using a WK Dickson in-house spreadsheet described in **Section 7.2.1.2** of this report. The cross-sections were altered slightly to facilitate constructability; however, the cross-sectional area, width to depth ratio, and side slopes were preserved. Typical pool sections include pools located on straight reaches and pools on meander bends.

7.2.1.4 Typical Meander Pattern

The design plans showing the proposed channel alignment are provided in **Appendix D**. The meander pattern was derived directly from the analog reach and sized using the scaling factors described in **Table 15**. The analog meander pattern was altered in some locations to provide variability in pattern, to avoid onsite constraints, to follow the valley pattern, and to make the channel more constructible. The morphologic parameters summarized in **Table 15** and **Appendix C** were applied wherever these deviations occurred.

7.2.1.5 Longitudinal Profiles

The design profiles are presented in **Appendix D**. These profiles extend throughout the entire project for the proposed channel alignment. The profiles were designed using the analog reach bed features that were sized with the scaling factors. The bed slopes and bankfull energy gradients were determined for each design reach based on the existing valley slope and the sinuosity of the design reach. Log structures will be utilized in the design to control grade, divert flows, and provide additional habitat diversity and stability.

Sod mats blanket the top of bank of this stream in Bertie County.

7.2.1.6 In-Stream Structures

Structures will be incorporated into the channel design to provide additional stability and improve aquatic habitat. Native materials and vegetation will be used for revetments and grade control structures where applicable. Additionally, woody debris will be placed throughout the channel at locations and at a frequency that is similar to those observed within the analog reaches. The analog reach has woody debris throughout the length of the channel, providing grade control for shallows and forcing scour pools. Woody habitat features installed will include leaf packs, dead brush, woody debris bundles, root wads, and wattles. Sod mats harvested onsite will be installed along stream banks during construction if and when feasible. Sod mats will only be harvested and used if comprised of appropriate vegetation. The use of sod mats that include aggressive turf grasses will be avoided. Sod mats (see photo above) are natural sections of vegetation taken from the banks when they were cut during construction, and are about nine inches thick. Before installation, proposed banks are graded lower than specified to accommodate the thickness of the mat. The mats are placed on top of the bank to act as a natural stabilizer of native species, and they grow much faster than the combination of coir fiber matting and seeding (see detail **Appendix D**). Other bank stability measures include the installation of cuttings bundles at three to five foot intervals along the tops of banks, live staking, root wads, and log toes. Typical details for proposed in-stream structures and revetments are in **Appendix D**.

7.2.2 Wetland Restoration Approach

The Cedar Creek Mitigation Site offers a total ecosystem restoration opportunity. As such, the wetland restoration is closely tied to the stream restoration. The proposed wetland restoration is located on the floodplains adjacent to the proposed stream enhancement of Cedar Creek and stream restoration of UT3. The proposed wetland is adjacent to a deeply incised and dredged stream channel in the upper valley and has been filled, drained, and altered in the lower valley. Wetland restoration is proposed only in areas that have been designated as hydric by a licensed soil scientist; however, the majority of the fields within the project area have been designated as Prior Converted (PC) cropland **Figure 4**.

7.2.2.1 Wetland Restoration Summary

Wetland restoration activities will consist of removing valley fill, filling drainage ditch, removing subsurface drainage tile, and raising adjacent stream channels and reconnecting the floodplain with seasonal and out of bank flows. Raising the stream bed will also reduce the "dry shoulder" effect near the stream channel. Specific restoration activities will include: reconnecting low lying areas of hydric soil with the floodplain, plugging agricultural drainage ditches, planting native tree and shrub species commonly found in small stream swamp ecosystems, and surface roughening to increase infiltration and storage. Wetland restoration limits and hydroperiods will be determined by on-site soil investigations and hydrologic modeling in conjunction with pre-construction water table monitoring at the restoration sites and reference wetlands. Combined with the proposed stream restoration, these actions will result in a sufficiently high water table and flood frequency to support hydrophytic vegetation and wetland hydrology, resulting in restored riparian wetlands.

Typical fill removal will be six to 12 inches and is not uniformly placed within the wetland area. A typical ditch plug will be 30 feet wide and extend above the ditch bank elevation approximately six inches. Plugs are to be constructed of compacted fill (clay or sandy clay) in 12 inch lifts with the upper 18 inches minimally compacted to facilitate plant growth. Ditch plugs will be placed to not create hydrologic trespass on areas outside the permanent conservation easement. Some areas of the existing channels and ditches may be left partially filled to function as temporal wetland habitat. The

farm road adjacent to the existing stream will be removed, graded to match surrounding contours, disked, and planted.

7.2.2.2 Proposed Wetland Hydrology

The Cedar Creek Stream and Wetland Mitigation site was once a Coastal Plain small stream swamp subject to prolonged inundation as indicated by soils mapping, historical aerial photography, and personal communication with landowners. Based upon the historical NRCS aerial photography, the proposed wetland restoration area was historically cleared, and the streams were channelized prior to 1958.

The restoration plan for the Cedar Creek wetland consists of reconstructing the stream channel with a higher bed elevation and plugging existing drainage ditches. The ditch plugs will lengthen wetland hydroperiods by halting artificial subsurface drainage and preventing rapid surface drainage. The stream design parameters will reconnect the stream to the floodplain and provide seasonal overbank flows. These periodic flows will provide surface and subsurface hydrology support to the newly created Coastal Plain small stream swamp system. This periodic flooding is vital to sustain plants and wildlife characteristic of riparian wetlands (Ainslie, 2002).

The drainage area for Wetland 1 is approximately 0.90 square miles. The restored wetlands will have a variable flooding regime due to the small size of the drainage area. The wetland restoration areas should experience seasonal out of bank flooding multiple times per year due to the shallow restored stream channel. This periodic flooding is vital to sustain plants and wildlife characteristic of riparian wetlands (Ainslie, 2002). In the absence of inundation, groundwater levels should remain near the surface due to reduced artificial drainage, increased infiltration, and elevated stream bed elevation. The wetland is designed to not remain inundated for greater than 24 hours following the one-year 24-hour storm. This will reduce potential waterfowl interactions with the adjacent airport. Small areas of standing water may be present in relic channel features for more prolonged durations.

The use of rainfall and stream modeling to estimate flood events demonstrates that the wetland restoration area will be subject to inundation and function as a riparian wetland system. However, limitations with the rainfall data set did not allow for statistically rigorous analysis of flooding depth or return interval.

7.2.2.3 Soils

Hydric soils within the proposed wetlands were verified through auger borings by a licensed soil scientist (**Appendix B**). The majority of the soil map units are Johns and Bibb and Johnston soils. The Bibb and Johnston soils are mapped within a shallow, concave depression along the slope. The stream channel bed will be raised, reconnecting the floodplain with seasonal out-of-bank flows. Raising the stream bed will also decrease the "dry shoulder" effect near the stream channel. A preliminary assessment of hydrologic trespass was performed on the site. It appears that the adjacent agricultural fields are topographically elevated sufficient to provide drainage onto the floodplain without impacting existing drainage. Restoration activities will include:

- Reconnecting low lying areas of hydric soil with the floodplain through stream restoration;
- Plugging/filling agricultural drainage ditches to raise the seasonal groundwater elevations;
- Planting native tree and shrub species commonly found in small stream swamp ecosystems; and
- Creating a rough soil surface to aid in infiltration and storage by ripping and disking.

These hydrology restoration activities will result in an elevated seasonal high water table, increased flood frequency and duration, and increased precipitation infiltration across the restored wetland.

It is estimated that the riparian wetland restoration will be 13.1 acres. Minor grading along the restored channels is proposed to remove fill excavated from channel dredging. No fill is proposed beyond plugging previously excavated channels and ditches. Soils in the wetland restoration area will be tested for fertility, and soil amendments may be specified as needed. This wetland will expand habitat along the easement and provide a more diverse community. Once constructed, this wetland will be monitored to document the success of hydrologic and vegetative restoration.

Wetland 1
This 13.1-acre wetland is located along UT3 and where it reaches the confluence of with UT1 Reach E. The current land use is sparsely wooded and active cropland. Hydrology will be restored by removing dredge material along the channel and filling/plugging abandoned ditches, raising the streambed elevation, bringing the water table closer to the ground surface.

7.2.3 Natural Plant Community Restoration

7.2.3.1 Plant Community Restoration

The restoration of the plant communities is an important aspect to the restoration of the site. Several sources of information were used to determine the most appropriate species for the restoration project. The selection of plants is based on what was observed at the reference reach, species present in the forest surrounding the restoration site, and what is typically native to the area. The reference stream is located within a disturbed Coastal Plain Small Stream Swamp. Dominant species included sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), swamp tupelo (*Nyssa biflora*), and red maple (*Acer ruburm*) in the canopy. Shrubs included sweet bay (*Magnolia virginiana*), American holly (*Ilex opaca*). The absence of bald cypress (*Taxodium distichum*) likely indicates past logging with poor regeneration at the site. The reference site was chosen due to the stability of the channel, the physical structure of the forest community, and to evaluate stream habitat. The species present are indicative of early successional species that have high dispersal rates. The mitigation site also supports many species typical of this community type due to its past disturbance history. Timber management is likely responsible for the absence of cypress. Typically, a Coastal Plain Small Stream Swamp would be located along the stream banks and adjacent floodplain of the proposed restoration site.

The restoration site has a relatively uniform topography. Based on observations of the reference community and the communities surrounding the mitigation site, two planting zones are appropriate: one for a riparian community type and one for a wetland community type. The zones vary slightly in species composition to ensure appropriate species are planted for the expected hydrologic regime. The variation more closely mimics the natural range seen in this community type. Therefore, Coastal Plain Small Stream Swamp will be the target community type and will be used for all areas within the project, as well as for buffer around the site. The plant species list has been developed and can be found in **Table 16**. Species with high dispersal rates such as red maple, tulip poplar, and sweetgum are not included because of local occurrence and the high potential for natural regeneration.

The restoration of plant communities along the tributaries to Great Coharie Creek will provide stabilization and diversity. For rapid stabilization of the stream banks (primarily outside meanders), silky dogwood, silky willow, and black willow were chosen for live stakes along the restored channel because of their rapid growth patterns and high success rates. Willows will also be quicker to contribute organic matter to the channel. Willows grow at a faster rate than the species planted around

them and stabilize the stream banks. When the other species are bigger and able to stabilize the channel banks, the black willow and silky willows will slowly stop growing or die out, allowing the other species to outgrow them and create shade that the willows do not tolerate. The live stake species will be planted along the outside of the meander bends two to three feet from the top of bank, creating a three-foot section along the top of bank. The live stakes will be spaced one per linear foot with alternate spacing vertically. See **Appendix D** for a detailed planting plan.

Table 16. Proposed Plant List

Bare Root Planting Tree Species - Riparian Areas (Zone 1)			
Common Name	**Scientific Name**	**Wetland Indicator***	**Percent Composition**
River birch	*Betula nigra*	FACW	15%
Green ash	*Fraxinus pennsylvanica*	FACW	15%
Tulip poplar	*Liriodendron tulipifera*	FACU	15%
Swamp chestnut oak	*Quercus michauxii*	FACW	20%
Water oak	*Quercus nigra*	FAC	20%
American sycamore	*Platanus occidentalis*	FACW	15%
Bare Root Planting Tree Species - Wetland Areas (Zone 2)			
Common Name	**Scientific Name**	**Wetland Indicator***	**Percent Composition**
River birch	*Betula nigra*	FACW	15%
Green ash	*Fraxinus pennsylvanica*	FACW	15%
Swamp chestnut oak	*Quercus michauxii*	FACW	15%
Laurel oak	*Quercus laurifolia*	FACW	20%
Overcup oak	*Quercus lyrata*	OBL	20%
Bald cypress	*Taxodium distichum*	OBL	15%

Bare root planting notes:

1) Planting density approximately 680 bare root stems per acre.
2) Planted on a diamond grid to limit preferential linear flow.

Live Staking and Live Cuttings Bundle Tree Species			
Common Name	**Scientific Name**	**Wetland Indicator***	**Percent Composition**
Silky dogwood	*Cornus amomum*	FACW	45%
Silky willow	*Salix sericea*	OBL	45%
Black willow	*Salix nigra*	OBL	10%

*National Wetland Indicator Status from Draft Rating 2012-Atlantic Gulf Coastal Plain.

7.2.3.2 On-Site Invasive Species Management

Some invasive species have been noted on the site. They include Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), and Japanese honeysuckle (*Lonicera sempervirens*). These invasive species are common, but not limited to any confined location. The movement of topsoil will also stir up weed seeds, but most will be inhibited by the raising of the water table on the site. It will be important during monitoring site visits to check for any significant encroachment of invasive species and to develop a plan of action to control any such problem.

7.2.4 Best Management Practices

Due to the rural nature of this project, individual stormwater best management practices (BMPs) will

not be required. However, diffuse flow structures will be applied at locations where ditches or other forms of concentrated flow enter the conservation easement. These structures will consist of a pool (forebay) located just outside the conservation easement that will attenuate runoff combined with grading and stabilization techniques that will diffuse flow upon entering the buffer. All diffuse flow structures will be installed within the conservation easement so that landowners will not have access to the structures. Failure or maintenance of the structures is not anticipated as these structures will be installed in low-gradient areas, and the areas proposed to diffuse flow will be well vegetated and matted.

Stormwater management issues resulting from future development of adjacent properties will be governed by the applicable state and local ordinances and regulations. It is recommended that any future stormwater entering the site maintain pre-development peak flow. Any future stormwater diverted into the project should be done in a manner as to prevent erosion, adverse conditions, or degradation of the project in any way.

7.2.5 Soil Restoration

After construction activities, the subsoil will be ripped or deep tilled with a chisel plough to destroy plow pan or hardpan present to promote infiltration and increase soil water storage. Any compaction will be deep tilled before the topsoil is placed back over the site. Any topsoil that is removed during construction will be stockpiled and placed over the site during final soil preparation. This process should provide favorable soil conditions for plant growth.

7.3 Data Analysis

7.3.1 Stream Data Analysis

7.3.1.1 Stream Hydrologic Analysis

Hydrologic evaluations were performed for the design reaches using multiple methods to determine and validate the design bankfull discharge and channel geometry required to provide regular floodplain inundation. The use of various methods allows for comparison of results and eliminates reliance on a single model. Peak flows (**Table 17**) and corresponding channel cross-sectional areas were determined for comparison to design parameters using the following methods:

- Regional Flood Frequency Analysis,
- Intellisolve's Hydraflow Express Hydrographs,
- NC and VA/MD Regional Curves for the Coastal Plain, and
- USGS regional regression equations for rural conditions in the Coastal Plain.

Regional Flood Frequency Analysis
A flood frequency analysis was completed for the study region using historic gauge data on all nearby USGS gauges with drainage areas less than 6,400 acres (10 mi^2) which passed the Dalrymple homogeneity test (Dalrymple, 1960). This is a subset of gauges used for USGS regression equations. Regional flood frequency equations were developed for the 1.1-, 1.5-, and 2-year peak discharges based on the gauge data. Discharges were then computed for the design reach. These discharges were compared to those predicted by the discharge regional curve and USGS regional regression 2-year discharge equations.

Intellisolve's Hydraflow Express Hydrographs
Hydraflow Express was used to simulate the rainfall-runoff process and establish peak flows for the watersheds. This model was chosen over the U.S. Army Corps of Engineers model HEC-1 because it

allows the user to adjust the peak shape factor for the Coastal Plain conditions. Using a standard Type III distribution in HEC-1, the model will use a 284 peak shape factor, which is the outdated standard for a coastal environment. This results in conservatively high peak flows that may not be appropriate for a stream restoration design. NRCS staff has recommended using peak shape factors between 60 and 100 for the Coastal Plain. Hydraflow Express allows the user to make this adjustment to the peak shape factor.

Regional Curve Regression Equations

The North Carolina Coastal Plain regional curves by Doll et al (2003) and Sweet and Geratz (2003) and the Virginia/Maryland (Krstolic et al., 2007) Coastal Plain regional curves for discharge were used to predict the bankfull discharge for the site. The NC regional curves predicted flows that are similar to those predicted by the 1.1-year flood frequency, while the VA/MD curves are comparable to flows predicted by the 1.5-year flood frequency equation. The regional curve equations for NC discharges by Doll et al. (2003) (1) and Sweet and Geratz (2003) (2) and VA/MD (3) discharges are:

(1) $Q_{bkf}=16.56*(DA)^{0.72}$ (Doll et al., 2003)
(2) $Q_{bkf}=8.49*(DA)^{0.76}$ (Sweet and Geratz, 2003)
(3) $Q_{bkf}= 28.3076*(DA)^{0.59834}$ (Krstolic et al., 2007)

Where Q_{bkf}=bankfull discharge (ft^3/s) and DA=drainage area (mi^2).

USGS Regional Regression Equations

USGS regression equations estimate the magnitude and frequency of flood-peak discharges (Gotvald, et al., 2009). The regression equations were developed from gauge data in different physiographic regions of the Southeastern United States. For this analysis, there was only concern for the two-year return interval. The equation for the rural Coastal Plain (Hydrologic Region 4) is:

(4) $Q_2=60.3*(DA)^{0.649}$

Table 17. Peak Flow Comparison

Reach	Drainage Area (Ac)	Hydraflow Hydrographs Q_1	FFQ $Q_{1.1}$	FFQ $Q_{1.5}$	NC Regional Curve Q (1)	NC Regional Curve Q (2)	VA/MD Regional Curve Q (3)	Regional Regression Eqns. Q_2	Design/ Calculated Q
Analog	81	2	5	7	4	2	8	16	5
UT2	35	4	2	3	2	1	5	9	4
UT3	151	6	7	11	6	3	12	24	6

The fact that the regional curves predict flows similar to the 1.1-year flood frequency analysis indicates that the bankfull flows occur in the region with a frequency of approximately once a year. The developers of the NC Coastal Plain regional curves report an average recurrence interval of 1.12 years for the gauged streams included in their study.

7.3.1.2 Sediment Transport Analysis

An erosion and sedimentation analysis was performed to confirm that the restoration design creates a stable sand bed channel that neither aggrades nor degrades over time. Typically, sediment transport is assessed to determine a stream's ability to move a specific grain size at specified flows. Various sediment transport equations may be easily applied when estimating entrainment for gravel bed

streams; however, these equations are not as effectively applied to sand bed channels where the entire bed becomes mobile during geomorphically significant flows. Therefore, more sophisticated modeling techniques were used to analyze the stream design for this project. The following methods and functions were utilized during the sediment transport analysis:

- Stable Channel Design Function – Copeland Method (HEC-RAS),
- Shear Stress, and
- Velocity.

Stable Channel Design

Design cross-section dimensions, as determined from the analog approach, were evaluated using the stable channel design functions within HEC-RAS. These functions are based upon the methods presented in the SAM Hydraulic Design Package for Channels developed by the USACE Waterways Experiment Station. The Copeland Method was developed specifically for sand bed channels (median grain size restriction of 0.0625 mm to 2 mm) and was selected for application at Cedar Creek. The method sizes stable dimensions as a function of slope, discharge, roughness, side slope, bed material gradation, and the inflowing sediment discharge. Results are presented as a range of widths and slopes, and their unique solution for depth, making it easy to adjust channel dimensions to achieve stable channel configurations. The stable design output parameters are listed in **Table 18**. The results for UT3 are acceptable and match closely with the design reach parameters. The results for UT2 are slightly higher when compared to the design parameters and the results of the shear stress and velocity approaches. These results may be attributed to the model's limitations when modeling channels with very small cross-sectional areas as proposed for UT2.

Table 18. Stable Channel Design Output

Reach	Q (ft/s^3)	Bottom Width (ft)	Depth (ft)	Energy Slope (ft/ft)	Composite n value	Velocity (ft/s)	Shear Stress (lbs/ft^2)
UT2	4	2	0.6	0.017	0.04	2.6	0.6
UT3	6	3	0.8	0.009	0.026	1.9	0.29

Shear Stress Approach

Shear stress is a commonly used tool for assessing channel stability. Allowable channel shear stresses are a function of bed slope, channel shape, flows, bed material (shape, size, and gradation), cohesiveness of bank materials, and vegetative cover. The shear stress approach compares calculated shear stresses to those found in the literature. Shear stress is the force exerted on a boundary during the resistance of motion as calculated using the following formula:

(1) $\tau = \gamma RS$

τ = shear stress (lb/ft^2)
γ = specific gravity of water (62.4 lb/ft^3)
R = hydraulic radius (ft)
S = average channel slope (ft/ft)

Table 19. Comparison of Allowable and Proposed Shear Stresses

Reach	Proposed Shear Stress at Bankfull Stage (lbs/ft^2)	Critical Shear Stress (lbs/ft^2)	Allowable Shear Stress[1]	
			Sand/Silt/Clay (lbs/ft^2)	Vegetation (lbs/ft^2)
UT2	0.42	>0.003	0.03 to 0.26	0.2 to 0.95

Reach	Proposed Shear Stress at Bankfull Stage (lbs/ft^2)	Critical Shear Stress (lbs/ft^2)	Allowable Shear Stress[1]	
			Sand/Silt/Clay (lbs/ft^2)	Vegetation (lbs/ft^2)
UT3	0.33	>0.003	0.03 to 0.26	0.2 to 0.95

[1](Fischenich, 2001)

Review of the above table shows that the proposed shear stresses for the Cedar Creek design reaches fall above the critical shear stress (shear stress required to initiate motion) and allowable limits for sand/silt; however the proposed shear stresses do fall within the limits for vegetation. To prevent instability that may occur due to higher shear stresses, grade control structures are proposed at frequent intervals to prevent bed degradation. The proposed channel should remain stable with the increased number of structures and established vegetation.

Velocity Approach

Published data are readily available that provide entrainment velocities for different bed and bank materials. A comparison of calculated velocities to these permissible velocities is a simple method to aid in the verification of channel stability. **Table 20** compares the proposed velocities calculated using Manning's equation with the permissible velocities presented in the Stream Restoration Design Handbook (NRCS, 2007).

Table 20. Comparison of Allowable and Proposed Velocities

Reach	Design Velocity (ft/s)	Allowable Velocity[1] (ft/s)	
		Fine Sand	Coarse Sand
UT2	1.9	2.0	4.0
UT3	1.9	2.0	4.0

[1](NRCS, 2007)

Sediment Supply

In addition to the stability assessment, a qualitative analysis of sediment supply was performed by characterizing watershed conditions. A combination of field reconnaissance and windshield surveys, existing land use data, and historical aerial photography were analyzed to assess existing and past watershed conditions and to determine if any changes occurred that would significantly impact sediment supply. As discussed in **Section 4.1.3**, the land use throughout the site, and primarily around restoration reaches UT2 and UT3 has changed little since the late 1970s. Much of the project area has been used primarily for agricultural purposes over the past 50 years, and current land use within the project is composed of approximately 30% cultivated land, 5% open space and 65% forest cover. Between 1964 and 1980, several significant land disturbing events occurred near the project. Both UT2 and UT3 were channelized and much of the forested corridors were cleared, much of the right buffer along UT1 was cleared, an inline pond was constructed at the upstream end of UT3, and a large inline pond was constructed on UT1 just upstream of Boykin Bridge Road. The Sampson County Airport (located adjacent to UT3) was built during the late 1970s; however, the majority of the airport property drains away from the project site. The only other noticeable events occurred between 1993 and 1998 when portions of the watershed associated with UT2 and UT3 were harvested for timber. Overall, the project watershed is relatively stable and has largely been maintained as agricultural land since the 1970s. Much of the existing forested areas are located either around existing drainage features or along portions of the project streams. Land use has remained relatively constant within this rural watershed, and significant land disturbing activities are not anticipated for the future.

A large percentage of the cultivated areas are located in the upper and middle portions of the project watersheds for UT2 and UT3. Additionally, the land use within the UT2 watershed is comprised of 41% agriculture fields and 59% forest, while the UT3 watershed is approximately 32% forest cover, 27% agriculture fields, and 41% a mix of airport open space and residential. Observations and assessments of these reaches show little signs of aggradation (deposition), but there is evidence of degradation as a result of headcuts located within the upper sections of both UT2 and UT3. The headcuts, and subsequent incision, appear to be the result of historic channelization and straightening. Per discussions with landowners, much of the incision at the upper end of UT3 may be attributed to a dam breach that occurred within the past 15 years. Stream segments downstream of the headcuts, while incised, appear physically stable, indicating that the reaches are able to effectively transport the sediment supplied by their respective watersheds. There are several localized areas of instability and erosion along the channels, which appear to be a result of agricultural activities occurring up to and along channel banks and not from watershed activities. It is anticipated that sediment supply from agricultural land adjacent to the project will decrease as buffers are enhanced and widened, and flow from existing agricultural ditches will be diffused before entering the proposed channel.

Since little deposition was observed along the restoration reaches, it appears that the channels are able to effectively move the sediment supplied from the surrounding watershed. Also, because observed areas of degradation can be attributed to historic channelization and farming practices adjacent to the channel and not watershed activities, a threshold channel design approach was used. This approach assumes minimal movement (vertical or lateral migration) of the channel boundary during design flow conditions, and that the channel is not sensitive to sediment supply. Additionally, grade controls have been integrated throughout the design to provide vertical stability in the event scour should occur.

7.3.1.1 Hydraulic Analyses

Hydraulic evaluations were performed for the restoration design reaches. These analyses were performed to confirm that the restoration designs will convey the design discharge, provide more frequent overbank flooding, and that significant structures will perform as designed.

HEC-RAS Analysis

A hydraulic analysis was performed to confirm that the restoration design results in a channel that will convey the design discharge and provide for frequent flooding of the adjacent riparian floodplain and wetlands. Channel characteristics, including cross-sectional dimension, slope, and roughness, were used to analyze and adjust design parameters calculated by the analog/reference reach approach.

HEC-RAS was used to perform the hydraulic analysis. This model is a hydraulic model developed by the US Army Corps of Engineers' Hydrologic Engineering Center to perform one-dimensional (1-D) steady and unsteady flow calculations. The model uses representative geometric data (cross-sections) and hydraulic computation routines.

Design cross-sectional dimensions determined through the analog/reference reach approach were evaluated using the 1-D steady flow analysis component and the channel design functions within the HEC-RAS Model (Version 4.0.0). The cross-sectional dimensions for reaches UT2 and UT3 were iteratively adjusted based on the model results to produce a channel design that will regularly flood the adjacent riparian areas. Model results are presented in **Appendix C.** The results are organized by reach, discharge, and STA number and include water surface elevation, velocity, flow area, stream power, and shear stress.

7.3.1 Wetland Data Analysis

7.3.1.1 Wetland Hydrologic Analysis

In general, hydrology of a small stream swamp wetland system is derived from seasonal or temporary overbank flooding of the adjacent stream channel and the seasonal high water table elevation controlled by the stream water surface elevation. Many resources describe the duration and frequency of flooding as highly inconsistent. As described by Schafale and Weakley (1990), small stream swamp systems have highly variable flow regimes with floods of short duration and periods of very low flow; however, smaller watersheds lead to a more variable flooding regime. Additionally, the influence of channel overbank flow may vary seasonally to yearly in magnitude, duration, and frequency (WRP Technical Note HY-EV-2.1, 1993). It may be anticipated that the majority of flooding of riparian wetlands occurs during the winter months and the early portions of the growing season. Surface water of riparian wetlands may be present for extended periods during the growing season and usually greater than 14 consecutive days, but is typically absent by the end of the growing season in most typical years (EPA, 1995). Field indicators of surface inundation include water-stained leaves, drifts lines and water marks on trees (EPA, 1995). In the absence of surface water, the water table is often near the ground elevation.

Due to the direct relationship between stream flow and riparian wetland hydrology, the proposed stream was designed to provide periodic overbank flow within the bounds of the proposed wetland.

7.3.1.2 Wetland Water Budget

The proposed wetland restoration areas are located adjacent to UT3 (UT3A and B) and on the floodplain of Cedar Creek. Runoff from the local watershed will also provide hydrologic input and will provide the opportunity for nutrient and pollutant removal in these wetlands. To determine the general input from the watershed in terms of providing significant hydrology needed to sustain saturated conditions, a general water balance analysis was performed.

In order to determine suitable hydrology for the proposed Wetland Creation/Enhancement Coastal Plain Small Stream Swamp, existing hydrologic conditions were evaluated through a water balance analysis. This water balance is a model for estimating water depths and potential drawdown for the proposed wetland construction. A watershed approach was applied and methods outlined in *Planning hydrology for constructed wetlands* (Pierce, 1993) were followed.

The water balance presented in this report was determined from the following equation:
$S = P + R + G - ET - I$. Where S is storage, P is precipitation, R is runoff, G is groundwater discharge, ET is evapotranspiration, and I is infiltration (or groundwater recharge) (Pierce, 1993).

It is expected that regular occurrences of overbank flooding will provide significant hydrologic input into these wetlands that is not shown in these water balance calculations. Long-term rainfall was obtained from the North Carolina Climate Office, and potential runoff was estimated using methodology detailed in Urban Hydrology for Small Watershed-Technical Release 55 (USDA-NRCS 1986). Components of the water balance are defined below.

Groundwater
Due to landscape position and the geology of the coastal plain, groundwater can provide significant input to a wetland system. Where present, the amount of groundwater input is difficult to estimate. Within the lower landscape positions, it was assumed that any groundwater is relatively static, and any discharge elevation is just below the wetland and does not provide direct hydrologic input, but prevents infiltration, resulting in both values being zero.

Precipitation
Daily precipitation data and temperature data from the Clinton weather station has been compiled for a 26-year period of record from January 1988 through August 2013 (The North Carolina State Climatologist http://www.nc-climate.ncsu.edu/; **Appendix B**). The Clinton Station was used, as it is the closest station to the site with a large portion of the records available. Average monthly precipitation values were then calculated from these data and applied to the water balance calculations.

Precipitation only calculates runoff from the small local watershed to the wetland restoration. The larger drainage area encompassed by the adjacent channel is not evaluated, but will contribute overbank flows to provide additional input to wetland hydrology.

Evapotranspiration
An estimate for Evapotranspiration was calculated based on daily temperatures by a method defined by Richard Allen et al. (2006).

$$ET_o = 0.0023(T_{mean} + 17.8)\ (T_{max} - T_{min})^{0.5} R_a$$

Where;

ET_o	reference crop evapotranspiration [mm day-1]
T_{mean}	daily mean air temperature [°C]
T_{max}	daily maximum air temperature [°C]
T_{min}	daily minimum air temperature [°C]
R_a	extraterrestrial radiation [MJ m-2 day-1]

Values for R_a for different latitudes are given in a table provided by the authors, where values "deviate from values that are averaged over each day of the month by less than one percent for all latitudes during non-frozen periods ..."

Runoff Calculations
Runoff onto the wetland restoration/enhancement site was determined by using the TR-55 Curve Number Method as described by Pierce 1993. Rainfall is defined as each 24-hour rainfall total as recorded by the local weather station. The drainage area for the local watershed of each proposed wetland was delineated using 7.5 Minute USGS topographic quadrangle for Drake, North Carolina; (**Figure 2**).

Determination of days producing runoff is based upon the minimum rainfall amount needed to produce runoff (*Q*). The value of Q for the drainage area was calculated from daily precipitation values over the period of record. The equation for calculating runoff is as follows:

$$Q = \frac{(P_{24} - 0.2S)^2}{(P_{24} + 0.8S)}$$

$$S = \left(\frac{1000}{CN}\right) - 10$$

$$Q = \frac{\left[P_{24} - 0.2\left(\left(\frac{1000}{CN}\right) - 10\right)\right]^2}{\left[P_{24} + 0.8\left(\left(\frac{1000}{CN}\right) - 10\right)\right]}$$

P_{24}

A 24-hour rainfall record was determined using daily precipitation data.

Q

Runoff determined using precipitation data and watershed characteristics specific to the site.

S

The potential maximum retention after runoff begins (inches). This is related to soil and soil cover conditions of the watershed through the Curve Number (see below).

Where P_{24} is the maximum rainfall occurring in each 24-hour period (over the period of record), CN is the composite curve number, and S is the storage capacity of the soil. A composite curve was calculated by subdividing the watershed with respect to soil hydrologic group and land use, then determining the appropriate curve number for each subdivision using tables published by the USDA (1986). The area and curve number were multiplied, summed and divided by the total watershed area to calculate the composite curve number as described below.

$$CN = \frac{\sum(CN * SubdividedArea)}{(WatershedArea)}$$

By this method the composite curve number for proposed wetland creation/enhancement site was 65.4.

Daily runoff (R) was calculated from the amount of precipitation (P) for each day. Those days that returned positive values (i.e. runoff occurred) were then summed to return the monthly runoff (R) produced within the watershed area. The calculated daily runoff is then summed to return the amount of *runoff* (*R*) produced by each acre in the watershed. Once runoff values were calculated for the drainage area, it was necessary to adjust these values to reflect the amount of water seen on the site as follows:

*R = (Watershed Runoff) * (Watershed Area) / (Site Area)*

These runoff values are then summed by month for the entire period and averaged for the watershed to give a monthly runoff average. Runoff for each wetland is summarized in **Appendix 2**.

Infiltration

The proposed wetland restoration / enhancement area is mapped as Bibb and Johnston soils, Johns fine sandy loam, and Marvyn loamy sand soil. Soil borings in these areas indicates the soil is closer to Bibb or Johnston soil.

Infiltration into the soil on the site was based upon the permeability range (0.0 to 0.05 in/hr) indicated for hydrologic soil group D soils (USDA 1986). During months where the seasonal high water table is above 12 inches, the infiltration was assumed to be negligible and set to zero. The soil typically has

a seasonal high water table from December through April ranging from zero to 12 inches in depth. Infiltration is calculated by converting permeability from centimeters per second (cm/sec) to inches per month (in/mo). Infiltration is expected to be low or near zero during these months, and was estimated to be zero for the water balance calculation.

Hydrograph
The calculated data has been compiled and a hydrograph has been plotted illustrating the monthly average flow of water in and out of the proposed wetland construction area (**Appendix B**). These values are represented in acre-inches. Results of this analysis indicate that there is a period of drawdown during the months of April through November. These results also indicate that runoff and direct precipitation will, in average years, provide jurisdictional wetland hydrology during the growing season at the wetland restoration area.

Conclusions
This water balance analysis was conducted to evaluate the existing hydrology of the proposed wetland restoration area and to determine if the proposed wetland design is appropriate for this site. The modeling presented in this report indicates that there is sufficient hydrology at appropriate times of the year to support wetland vegetation.

Field observations indicate that existing conditions of the proposed wetland restoration area includes hydric soils and proximity to the floodplain. These observations suggest that overbank flows from the restored stream channel will play a significant role in overall site hydrology. The water balance analysis assures a minimum water source to the site. It is expected that regular occurrences of overbank flooding will provide significant hydrologic input into these wetlands not shown in these water balance calculations.

7.4 Mitigation Summary

Natural channel design techniques have been used to develop the restoration designs described in this document. The combination of the analog and analytical design methods was determined to be appropriate for this project because the watershed is rural, the causes of disturbance are known and have been abated, and there are minimal infrastructure constraints. The original design parameters were developed from the measured analog/reference reach data and applied to the subject stream. The parameters were then analyzed and adjusted through an iterative process using analytical tools and numerical simulations of fluvial processes. The designs presented in this report provide for the restoration of natural Coastal Plain sand-bed channel features and stream bed diversity to improve benthic habitat. The proposed design will allow flows that exceed the design bankfull stage to spread out over the floodplain, restoring a portion of the hydrology for the existing wetlands.

A large portion of the existing stream will be filled using material excavated from the restoration channel and from the farm path built adjacent to the channel. However, many segments will be left partially filled to provide habitat diversity and flood storage. Native woody material will be installed throughout the restored reach to reduce bank stress, provide grade control, and increase habitat diversity.

Forested riparian buffers of at least fifty feet on both sides of the channel will be established along the project reach. An appropriate riparian plant community, a Coastal Plain Small Stream Swamp, will be established to include a diverse mix of species. Two zones will be used depending upon expected hydrologic conditions. Replanting of native species will occur where the existing buffer is impacted during construction.

Reductions in nutrients and other pollutants will be achieved with the buffer restoration work, providing substantial benefits to the watershed. The proposed restoration within the Cedar Creek Site is hydrologically connected. Wetland W1 is proposed adjacent to the restoration of UT3 and the enhancement of UT1.

8 MAINTENANCE PLAN

NCEEP shall monitor the site on a regular basis and shall conduct a physical inspection of the site 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:

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 stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting.
Wetland	Routine wetland maintenance and repair activities may include securing of loose coir matting and supplemental installations of live stakes and other target vegetation within the wetland. Areas where stormwater and floodplain flows intercept the wetland may also require maintenance to prevent scour.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.
Utility Right-of-Way	Utility rights-of-way within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Ford Crossing	Ford crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Road Crossing	Road crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.

9 PERFORMANCE STANDARDS

The success criteria for the Cedar Creek Site stream restoration will follow accepted and approved success criteria presented in the USACE Stream Mitigation Guidelines and subsequent NCEEP and agency guidance. Specific success criteria components are presented below. Monitoring reports will be prepared annually and submitted to EEP.

9.1 Stream Restoration Success Criteria

9.1.1 Bankfull Events

Two bankfull flow events must be documented within the seven-year monitoring period. The two bankfull events must occur in separate years. Otherwise, the stream monitoring will continue until two bankfull events have been documented in separate years.

9.1.2 Cross Sections

There should be little change in as-built cross-sections. If changes do take place, they should be evaluated to determine if they represent a movement toward a less stable condition (for example down-cutting or erosion), or are minor changes that represent an increase in stability (for example settling, vegetative changes, deposition along the banks, or decrease in width/depth ratio). Cross-sections shall be classified using the Rosgen stream classification method, and all monitored cross-sections should fall within the quantitative parameters defined for channels of the design stream type.

9.1.3 Digital Image Stations

Digital images will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation, and effectiveness of erosion control measures. Longitudinal images should not indicate the absence of developing bars within the channel or an excessive increase in channel depth. Lateral images should not indicate excessive erosion or continuing degradation of the banks over time. A series of images over time should indicate successional maturation of riparian vegetation.

9.1.4 Surface Flow

Headwater valley restoration areas will be monitored to document intermittent or seasonal surface flow. This will be accomplished through direct observation, photo documentation of dye tests, and the use of stream gauge transducers with data loggers.

9.2 Wetland Hydrology Success Criteria

Success criteria and monitoring for wetland hydrology within the wetland restoration areas on the site will follow NCEEP Guidance dated 7 November 2011. The target minimum wetland hydroperiod will be 9 percent of the growing season. Stream hydrology and water balance calculations indicate the wetland area will meet jurisdictional criteria (5 percent hydroperiod). However, due to immature vegetation ad reduced PET, a longer success criterion is appropriate. Auto recording gauges will be used to measure daily groundwater elevations throughout the Sampson County growing season in all 7 years of monitoring.

9.3 Vegetation Success Criteria

Specific and measurable success criteria for plant density within the wetland restoration and riparian buffers on the site will follow NCEEP Guidance dated 7 November 2011. Vegetation monitoring plots will be a minimum of 0.02 acres in size, and cover a minimum of two percent of the planted

area. The following data will be recorded for all trees in the plots: species, height, planting date (or volunteer), and grid location. Monitoring will occur in the fall of Years 1, 2, 3, 5, and 7. The interim measures of vegetative success for the site will be the survival of at least 320 three-year old planted trees per acre at the end of Year 3, and 260 planted trees per acre at the end of Year 5. The final vegetative success criteria will be the survival of 210 planted trees per acre at the end of Year 7 of the monitoring period.

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

10 MONITORING REQUIREMENTS

The monitoring for the Cedar Creek Site stream mitigation will follow current accepted and approved monitoring requirements presented in the USACE Stream Mitigation Guidelines, NCEEP requirements, and subsequent agency guidance. The monitoring program will be implemented to document system development and progress toward achieving the success criteria. The restored stream morphology will be assessed to determine the success of the mitigation. The monitoring program will be undertaken for seven years or until the final success criteria are achieved, whichever is longer.

Monitoring reports will be prepared in the fall of each year of monitoring and submitted to NCEEP. The monitoring reports will include all information, and be in the format required by NCEEP in Version 2.0 of the NCEEP Monitoring Report Template (Oct. 2010). Specific monitoring components are presented below and summarized in **Table 21**.

Table 21. Monitoring Requirements

Required	Parameter	Quantity	Frequency	Notes
	Pattern	As per April 2003 USACE Wilmington District Stream Mitigation Guidelines	Baseline	Additional surveys will be performed if monitoring indicates instability or significant channel migration
	Dimension	As per April 2003 USACE Wilmington District Stream Mitigation Guidelines	Baseline, Years 1,2,3,5, and 7	Surveyed cross sections and bank pins
	Profile	As per April 2003 USACE Wilmington District Stream Mitigation Guidelines	Baseline	Additional surveys will be performed if monitoring indicates instability
	Surface Water Hydrology	As per April 2003 USACE Wilmington District Stream Mitigation Guidelines	Annual	Crest Gauges and/or Pressure Transducers will be installed on site; the devices will be inspected on a quarterly/semi-annual basis to document the occurrence of bankfull events on the project
	Groundwater Hydrology		Annual	Groundwater monitoring gauges with data recording devices will be installed on site; the data will be downloaded on a quarterly basis during the growing season
	Vegetation		Annual	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols
	Exotic and Nuisance Vegetation		Annual	Locations of exotic and nuisance vegetation will be mapped
	Project Boundary		Semi-annual	Locations of fence damage, vegetation damage, boundary encroachments, etc. will be mapped
	Stream Visual		Annual	Semi-annual visual assessments
	Wetland Visual		Annual	Semi-annual visual assessments

10.1 Baseline Monitoring

A baseline monitoring report documenting stream restoration activities will be developed within 60 days of the planting completion on the mitigation site. The report will include all information required by NCEEP baseline monitoring report guidelines, including elevations, photographs and sampling plot locations, gauge locations, and a description of initial species composition by community type. The report will also include a list of the species planted and the associated densities. Baseline vegetation monitoring will follow CVS-NCEEP Protocol for Recording Vegetation Version 4.0. Level 1 and Level 2 monitoring will be conducted. The baseline monitoring report will follow Baseline Monitoring Report Template and Guidance version 2.0 (14 Oct. 2010).

10.2 As-Built Survey

An as-built survey will be conducted following construction to document channel size, condition, and location. The survey will include a complete profile of Thalweg, water surface, bankfull, and top of bank to compare with future geomorphic data. Longitudinal profiles will not be required in annual monitoring reports unless requested by NCEEP or USACE. Stream channel stationing will be marked with stakes placed near the top of bank every 100 feet.

10.3 Visual Monitoring

Visual monitoring of all mitigation areas will be conducted a minimum of twice per monitoring year by qualified individuals. The visual assessments will include vegetation density, vigor, invasive species, and easement encroachments. Visual assessments of stream stability will include a complete stream walk and structure inspection. Digital images will be taken at fixed representative locations to record each monitoring event as well as any noted problem areas or areas of concern. Results of visual monitoring will be presented in a plan view exhibit with a brief description of problem areas and digital images. Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation, and effectiveness of erosion control measures. Longitudinal photos should indicate the absence of developing bars within the channel or an excessive increase in channel depth. Lateral photos should not indicate excessive erosion or continuing degradation of the banks over time. A series of photos over time should indicate successional maturation of riparian vegetation.

10.4 Cross Sections

Permanent cross-sections will be installed at a minimum of one per 20 bankfull widths with half in pools and half in shallows. All cross-section measurements will include bank height ratio and entrenchment ratio. Cross-sections will be monitored annually. There should be little change in as-built cross-sections. If changes do take place, they should be evaluated to determine if they represent movement toward a less stable condition (for example, down-cutting or erosion), or are minor changes that represent an increase in stability (for example, settling, vegetative changes, deposition along the banks, or decrease in width/depth ratio). Bank height ratio shall not exceed 1.2, and the entrenchment ratio shall be no less than 2.2 within restored reaches. Channel stability should be demonstrated through a minimum of two bankfull events documented in the seven-year monitoring period.

10.5 Bank Pin Arrays

At each cross section located on a meander, a bank pin array will be installed along the outer bend and upstream third and downstream third of the meander. Bank pins will be a minimum of three feet long, and will be installed just above the water surface and every two feet above the lowest pin. Bank pin exposure will be recorded at each monitoring event, and the exposed pin will be driven flush with the bank.

10.6 Surface Flow

Headwater valley restoration areas will be monitored to document intermittent or seasonal surface flow. This will be accomplished through direct observation, photo documentation of dye tests, and the use of stream gauge transducers with data loggers. The as-built survey and gauge placement will allow for documentation of the duration of down valley surface flow.

11 LONG-TERM MANAGEMENT PLAN

Upon approval for closeout by the Interagency Review Team (IRT), the site will be transferred to the State of North Carolina (State). The State shall be responsible for periodic inspection of the site to ensure that restrictions required in the conservation easement or the deed restriction document(s) are upheld. Endowment funds required to uphold easement and deed restrictions shall be negotiated prior to site transfer to the responsible party.

12 ADAPTIVE MANAGEMENT PLAN

Upon completion of site construction, EEP 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 that the site's ability to achieve site performance standards are jeopardized, EEP 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 EEP will:

1. Notify the USACE as required by the Nationwide 27 permit general conditions.
2. Revise performance standards, maintenance requirements, and monitoring requirements as necessary and/or required by the USACE.
3. Obtain other permits as necessary.
4. Implement the Corrective Action Plan.
5. Provide the USACE a Record Drawing of Corrective Actions. This document shall depict the extent and nature of the work performed.

13 FINANCIAL ASSURANCES

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

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APPENDIX A

Site Protection Instrument(s)

Conservation Easement Deeds and Plats

STATE OF NORTH CAROLINA

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

SAMPSON COUNTY

SPO File Number: 82-S
EEP Project Number: 95718

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 _____day of _____, **2014**, by **RALPH HARVEY HAMILTON**, ("**Grantor**"), whose mailing address is **2503 W. Main St., Clinton, NC 28328**, 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 Ecosystem Enhancement Program (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 **ENVIRONMENTAL BANC & EXCHANGE, LLC, 909 CAPABILITY DR. SUITE 3100, RALEIGH, NC 27606,** 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 005011.

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 Ecosystem Enhancement Program 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 **SOUTH CLINTON TOWNSHIP, SAMPSON COUNTY, NORTH CAROLINA** (the "**Property**"), and being more particularly described as the following:

1. A certain parcel of land containing approximately 31 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 814 at Page 82** of the Sampson County Registry, North Carolina;
2. A certain parcel of land containing approximately 1.68 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 1220 at Page 990** of the Sampson County Registry, North Carolina;
3. A certain parcel of land containing approximately 243.67 acres and being conveyed to Grantor by deed as recorded in **Deed Book 1148 at Page 985** of the Sampson County Registry, North Carolina;
4. A certain parcel of land containing approximately 4 acres and being conveyed to Grantor by deed as recorded in **Deed Book 874 at Page 756** of the Sampson 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 **GREAT COHARIE CREEK, A TRIBUTARY OF THE CAPE FEAR RIVER.**

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 AREAS CONSIST OF THE FOLLOWING:

A. Sampson County PIN # 15041608003; Sheet 12 of 14 (Area 1 - **.545 acres** and Area 2 - **.359 acres**), containing a total **0.904 acres** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No.82-S, EEP Site No. 95718, Property of **RALPH H. HAMILTON**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

B. Sampson County PIN# 15013962001; Sheet 13 of 14, containing a total of **.055 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-S, EEP Site No. 95718, Property of **RALPH H. HAMILTON**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

C. Sampson County PIN# 15041608005; Sheet 5 of 14, (Area 1 - **3.937 acres** and Area 2 - **.928 acres**), containing a total of **4.865 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-S, EEP Site No. 95718, Property of **RALPH H. HAMILTON**," dated **February 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

D. Sampson County PIN# 1500796003; Sheet 6 of 14, containing a total of **2.401 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-S, EEP Site No. 95718, Property of **Ralph H. Hamilton**," dated **February 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

A total of **8.225 acres** as described above.

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.

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. Vegetative Cutting. Except as related to the removal of non-native plants, diseased or damage 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.

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.

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. Ecosystem Enhancement Program, 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 subterraneous 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:**

Ecosystem Enhancement 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.

_____ (SEAL)
RALPH HARVEY HAMILTON

NORTH CAROLINA

COUNTY OF SAMPSON

I, _____, a Notary Public for _____County, North Carolina, certify that **Ralph Harvey Hamilton** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

Exhibit A

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE RALPH H. HAMILTON PROPERTY – SHEET 5 of 14
S. P. O. File # 82-S
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

EASEMENT ONE:

BEGINNING at a point in the center of Cedar Creek, said point being located South 15 degrees 38 minutes 01 second West, 3743.96 feet from NCGS Station "CTZ A 2006" – N=446,890.3004 and E=2,190,822.1341 (NAD 83/2011), a joint corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry) and with Mary Lily Johnson Nuckolls, et als., and running thence with the Nuckolls, et als. line, South 08 degrees 41 minutes 36 seconds West, 10.15 feet to an existing iron stake, a control corner; thence again with the Nuckolls, et als. line, South 08 degrees 41 minutes 36 seconds West, 112.32 feet to a new iron stake and cap; thence again with the Nuckolls, et als line, South 08 degrees 41 minutes 36 seconds West, 67.25 feet to a new iron stake and cap, a new corner within the Ralph H. Hamilton Tract out of which this Conservation Easement is delineated (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry); thence a new line with Hamilton, the Easement line, the following courses and distances: North 79 degrees 10 minutes 45 seconds West, 448.26 feet to a new iron stake and cap; North 42 degrees 58 minutes 33 seconds West, 417.80 feet to a new iron stake and cap; North 73 degrees 33 minutes 23 seconds West, 405.14 feet to a new iron stake and cap; North 88 degrees 45 minutes 30 seconds West, 316.16 feet to a new iron stake and cap; North 71 degrees 39 minutes 28 seconds West, 130.67 feet to a new iron stake and cap, a corner of an access area between Easements One and Two; North 44 degrees 47 minutes 22 seconds East, 125.66 feet to a point in the centerline of Cedar Creek, a joint corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry);thence with the Hamilton Heirs' line, running with the centerline of Cedar Creek, the following courses and distances: South 14 degrees 25 minutes 41 seconds East, 7.88 feet; South 27 degrees 57 minutes 53 seconds East, 24.78 feet; South 52 degrees 31 minutes 17 seconds East, 15.48 feet; South 81 degrees 19 minutes 13 seconds East, 29.45 feet; South 87 degrees 44 minutes 31 seconds East, 24.00 feet; South 87 degrees 40 minutes 25 seconds East, 41.57 feet; South 87 degrees 20 minutes 51 seconds East, 49.24 feet; South 89 degrees 34 minutes 16 seconds East, 49.48 feet; South 85 degrees 58 minutes 39 seconds East, 29.26 feet; South 78 degrees 58 minutes 00 seconds East, 22.93 feet; North 88 degrees 26 minutes 13 seconds East, 49.50 feet; South 88 degrees 47 minutes 13 seconds East, 26.00 feet; South 79 degrees 28 minutes 23 seconds East, 22.59 feet; South 75 degrees 35 minutes 15 seconds East, 17.89 feet; South 80 degrees 46 minutes 28 seconds East, 31.14 feet; South 73 degrees 41 minutes 59 seconds East, 21.61 feet; South 78 degrees 04 minutes 12 seconds East, 24.72 feet; South 86 degrees 16 minutes 32 seconds East, 34.56 feet; South 81 degrees 24 minutes 17 seconds East, 13.45 feet; South 69 degrees 19 minutes 57 seconds East, 12.23 feet; South 61 degrees 30 minutes 07 seconds East, 18.77 feet; South 62 degrees 02 minutes 39 seconds East, 19.73 feet; South 61 degrees 27 minutes 59 seconds East, 51.46 feet; South 72 degrees 06 minutes 16 seconds East, 21.93 feet; South 73 degrees 23 minutes 01 second East, 25.04 feet; South 85 degrees 02 minutes 21 seconds East, 54.13 feet; South 83 degrees 58 minutes 29 seconds East, 22.69 feet; South 75 degrees 09 minutes 51 seconds East, 12.50 feet; South 58 degrees 49 minutes 17 seconds East, 16.19 feet; South 56 degrees 02 minutes 58 seconds East, 20.95 feet; South 63 degrees 57 minutes 09 seconds East, 24.37 feet; South 53 degrees 22 minutes 01 seconds East, 34.43 feet; South 51 degrees 44 minutes 07 seconds East 12.81 feet; South 54 degrees 38 minutes 26 seconds East, 33.68 feet; South 49 degrees 59 minutes 31 seconds East, 38.9 feet; South 62 degrees 44 minutes 19 seconds East, 13.7 feet; South 62 degrees 38 minutes 52 seconds East, 48.81 feet; South 49 degrees 48 minutes 50 seconds East,

35.38 feet; South 46 degrees 47 minutes 02 seconds East 7.18 feet to where the centerline of the Creek meets the centerline of an adjoining large ditch; thence continuing with the Creek, South 46 degrees 47 minutes 02 seconds East, 4.62 feet; South 32 degrees 20 minutes 31 seconds East, 8.34 feet; South 10 degrees 01minutes 34 seconds West, 12.63 feet East; South 09 degrees 02 minutes 26 seconds East, 17.62 feet West; South 07 degrees 12minutes 41 seconds East, 16.34 feet East; South 19 degrees 26 minutes 43 seconds East, 11.65 feet; South 75 degrees 36 minutes 45 seconds East, 19.26 feet; North 84 degrees 54 minutes 19 seconds East, 19.10 feet; North 88 degrees 11 minutes 55 seconds East, 3.96 feet; South 80 degrees 52 minutes 35 seconds East, 10.65 feet; South 24 degrees 27 minutes 32 seconds East, 6.87 feet; South 10 degrees 47 minutes 05 seconds East, 5.52 feet; South 04 degrees 26 minutes 27 seconds West, 7.98 feet; South 33 degrees 16 minutes 47 seconds West, 10.81 feet; South 39 degrees 24 minutes 14 seconds West, 8.30 feet; South 05 degrees 21 minutes 14 seconds West, 9.87 feet; South 12 degrees 01 minutes 28 seconds East, 10.31 feet; South 47 degrees 38 minutes 42 seconds East, 13.40 feet; South 53 degrees 21 minutes 07 seconds East, 18.54 feet; South 35 degrees 44 minutes 47 seconds East, 18.48 feet; South 53 degrees 31 minutes 26 seconds East, 17.65 feet; South 78 degrees 53 minutes 01 seconds East, 10.33 feet; North 80 degrees 22 minutes 04 seconds East, 9.59 feet; North 80 degrees 39 minutes 33 seconds East, 53.75 feet; North 81 degrees 39 minutes 24 seconds East, 17.79 feet; South 79 degrees 12 minutes 11 seconds East, 14.40 feet; South 78 degrees 19 minutes 33 seconds East, 23.78 feet; South 86 degrees 53 minutes 08 seconds East, 27.00 feet; North 85 degrees 52 minutes 03 seconds East, 19.62 feet; South 70 degrees 38 minutes 18 seconds East, 18.24 feet; South 40 degrees 01 minutes 32 seconds East, 13.57 feet; South 59 degrees 48 minutes 53 seconds East, 24.50 feet; North 62 degrees 45 minutes 49 seconds East, 19.33 feet; North 44 degrees 42 minutes 04 seconds East, 14.17 feet; North 29 degrees 36 minutes 06 seconds East 26.31 feet; North 29 degrees 56 minutes 49 seconds East, 18.55 feet; North 38 degrees 16 minutes 44 seconds East, 23.39 feet; North 55 degrees 37 minutes 24 seconds East, 27.44 feet; North 87 degrees 30 minutes 03 seconds East, 14.65 feet; North 89 degrees 13 minutes 16 seconds East, 18.76 feet; South 55 degrees 24 minutes 24 seconds East, 16.83 feet; South 89 degrees 34 minutes 38 seconds East, 12.45 feet; North 73 degrees 07 minutes 11 seconds East, 7.84 feet; South 84 degrees 00 minutes 50 seconds East, 9.72 feet; South 47 degrees 21 minutes 39 seconds East, 12.20 feet; South 52 degrees 48 minutes 10 seconds East, 28.05 feet; and South 31 degrees 59 minutes 00 seconds East, 0.54 feet to the **BEGINNING,** containing 3.937 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

EASEMENT TWO:

BEGINNING at a new iron stake and cap, said new iron stake and cap being located South 15 degrees 38 minutes 01 second West, 3743.96 feet; South 08 degrees 41 minutes 36 seconds West, 10.15 fee; South 08 degrees 41 minutes 36 seconds West, 112.32; South 08 degrees 41 minutes 36 seconds West, 67.25; North 79 degrees 10 minutes 45 seconds West, 448.26; North 42 degrees 58 minutes 33 seconds West, 417.80; North 73 degrees 33 minutes 23 seconds West, 405.14; North 88 degrees 45 minutes 30 seconds West, 316.16 feet; North 71 degrees 39 minutes 28 seconds West, 130.67 feet; and North 24 degrees 41 minutes 11 seconds West, 64.07 feet from NCGS Station "CTZ A 2006" – N=446,890.3004 and E=2,190,822.1341 (NAD 83/2011), said new iron stake and cap being a corner of an access area between Easements One and Two and a new corner within the Ralph H. Hamilton Tract out of which this Conservation Easement is delineated (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry); thence a new line with Hamilton, the Easement line, North 79 degrees 43 minutes 53 seconds West, 417.47 feet to a new iron stake and cap, a control corner; thence North 38 degrees 39 minutes 40 seconds East, 144.93 feet to a point in the centerline of Cedar Creek, a corner with the Frances J. Hamilton Heirs (Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence with the Hamilton Heirs, the centerline of Cedar Creek, the following courses and distances: South 53 degrees 44 minutes 53 seconds East, 1.21 feet; South 51 degrees 39 minutes 18 seconds East,

30.40 feet; South 46 degrees 30 minutes 07 seconds East, 19.86 feet; South 57 degrees 47 minutes 11 seconds East, 52.45 feet; South 64 degrees 33 minutes 16 seconds East, 36.40 feet; South 73 degrees 37 minutes 42 seconds East, 14.99 feet; North 68 degrees 12 minutes 35 seconds East, 6.71 feet; North 60 degrees 08 minutes 17 seconds East, 8.50 feet; North 48 degrees 07 minutes 03 seconds East, 13.44 feet; North 57 degrees 28 minutes 19 seconds East, 8.40 feet; North 63 degrees 32 minutes 40 seconds East, 9.70 feet; North 76 degrees 58 minutes 20 seconds East, 8.81 feet; South 8o degrees 35 minutes 21 seconds East, 7.90 feet; South 78 degrees 46 minutes 07 seconds East, 11.56 feet; South 63 degrees 56 minutes 22 seconds East, 48.07 feet; South 78 degrees 41 minutes 24 seconds East, 51.18 feet; South 83 degrees 51 minutes 02 seconds East, 51.27 feet; South 80 degrees 52 minutes 07 seconds East, 49.35 feet; North 88 degrees 30 minutes 15 seconds East, 8.57 feet; and South 58 degrees 43 minutes 39 seconds East, 3.85 feet; thence leaving the Creek, South 44 degrees 47 minutes 22 seconds West, 117.28 feet to the **BEGINNING,** containing .928 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE RALPH H. HAMILTON PROPERTY – SHEET 6 of 14
S. P. O. File # 82-S
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

BEGINNING at a new iron stake and cap set in the Western line of a Water Transmission Line Easement from Frances Faison Johnson, et als to Sampson (Deed Book 1545 at Page 311 of the Sampson County Registry), said iron stake and cap being located South 07 degrees 22 minutes 37 seconds East, 5617.85 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD 83/2011), and running thence with the Western edge of the Water Transmission Line Easement, South 22 degrees17 minutes 22 seconds West, 79.97 feet to a point; thence again with the Western edge of the Water Transmission Line Easement, South 21 degrees 45 minutes 06 seconds West, 3.87 feet to a point in the centerline of Cedar Creek, a corner with Mary Lily Johnson Nuckolls, et als, (Deed Book 1807 at Page 489 and Map Book 14 at Page 10 of the Sampson County Registry); thence with the Nuckolls line and the centerline of the run of Cedar Creek, the following courses and distances: North 57 degrees 38 minutes 48 seconds West, 24.17 feet; North 59 degrees 41 minutes 51 seconds West, 19.4 feet; North 37 degrees 43 minutes 43 seconds West, 25.49 feet; North 54 degrees 39 minutes 01 seconds West, 32.10 feet; North 67 degrees 24 minutes 17 seconds West, 54.65 feet; North 70 degrees 06 minutes 59 seconds West,22.77 feet; North 63 degrees 25 minutes 00 seconds West,21.29 feet; North 51 degrees 42 minutes 24 seconds West,27.23 feet; North 44 degrees 42 minutes 37 seconds West, 24.7 feet; North 48 degrees 52 minutes 58 seconds West, 24.4 feet; North 53 degrees 07 minutes 31 seconds West, 24.9 feet; North 65 degrees 48 minutes 13 seconds West, 23.46 feet; North 35 degrees 47 minutes 45 seconds West, 26.18 feet; North 52 degrees 19 minutes 58 seconds West, 45.18 feet; North 62 degrees 03 minutes 35 seconds West, 13.46 feet; North 17 degrees 56 minutes 49 seconds West, 13.02 feet; North 15 degrees 23 minutes 29 seconds West, 9.50 feet; North 08 degrees 29 minutes 32 seconds West, 13.39 feet; North 28 degrees 35 minutes 53 seconds West, 49.00 feet; North 30 degrees 02 minutes 47 seconds West, 49.17 feet; North 29 degrees 34 minutes 49 seconds West, 32.84 feet; North 46 degrees 54 minutes 09 seconds West, 13.84 feet; North 25 degrees 09 minutes 49 seconds West, 49.07 feet; North 36 degrees 17 minutes 44 seconds West, 51.81 feet; North 22 degrees 49 minutes 42 seconds West, 21.57 feet; North 22 degrees 39 minutes 09 seconds West, 21.85 feet; North 26 degrees 39 minutes 27 seconds West, 41.23 feet; North 23 degrees 10 minutes 01 seconds West, 25.94 feet; North 02 degrees 36 minutes 28 seconds West, 25.84 feet; North 18 degrees 55 minutes 04 seconds West, 19.21 feet; North 31 degrees 21 minutes 57 seconds West, 31.52 feet; North 24 degrees 05 minutes 26 seconds West, 43.49 feet; North 11 degrees 36 minutes 08 seconds West, 45.27 feet; North 22 degrees 36 minutes 39 seconds West, 50.22 feet; North 08 degrees 56 minutes 09 seconds West, 29.86 feet; North 11 degrees 29 minutes 43 seconds West, 24.01 feet; North 29 degrees 14 minutes 19 seconds West, 47.18 feet; North 15 degrees 52 minutes 01 seconds West, 26.21 feet; North 25 degrees 26 minutes 08 seconds West, 24.81 feet; North 23 degrees 07 minutes 12 seconds West, 34.53 feet; North 18 degrees 13 minutes 37 seconds West, 13.14 feet; North 02 degrees 31 minutes 36 seconds East, 10.60 feet; North 11 degrees 42 minutes 32 seconds West, 17.89 feet; North 41 degrees 34 minutes 56 seconds West, 23.66 feet; North 37 degrees 29 minutes 35 seconds West, 48.45 feet; North 57 degrees 38 minutes 45 seconds West, 27.59 feet; North 74 degrees 44 minutes 51 seconds West, 14.74 feet; North 45 degrees 49 minutes 43 seconds West, 12.61 feet; North 33 degrees 44 minutes 07 seconds West, 3.62 feet, a corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry); thence leaving Cedar Creek and running with the Hamilton Heirs' line, North 34 degrees 20 minutes 19 seconds East, 36.54 feet; North 41 degrees 55 minutes 57 seconds East, 36.90 feet; and North 36 degrees 15 minutes 26 seconds East, 14.09 feet to a new iron stake and cap set in the line of the Frances J. Hamilton Heirs and in the line of the tract of Ralph H. Hamilton, out of which this Conservation Easement is delineated (Deed Book 874 at Page 756 of the Sampson County Registry); thence the Easement line the following courses and distances: South 37 degrees 55 minutes 17 seconds East, 206.89 feet to a new iron stake and cap, a control corner; South 19 degrees 24 minutes 47 seconds East, 441.12 feet to a new iron stake and cap; South 26 degrees 53 minutes 32 seconds East, 303.48 feet to a

new iron stake and cap; South 50 degrees 20 minutes 43 seconds East, 246.94 feet to a new iron stake and cap; South 75 degrees 09 minutes 46 seconds East, 65.54 feet to a new iron stake and cap, a control corner; and South 53 degrees 23 minutes 29 seconds East, 74.44 feet to the **BEGINNING,** containing 2.401 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE RALPH H. HAMILTON PROPERTY – SHEET 12 of 14
S. P. O. File # 82-S
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

EASEMENT ONE:

BEGINNING at an existing iron stake, a control corner, a corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and a corner with the adjoining Ralph H. Hamilton property (Deed Book 1220 at Page 990 and Map Book 29 at Page 4 of the Sampson County Registry), said iron stake being located South 26 degrees 58 minutes 29 seconds West, 3008.41 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and running thence the adjoining Ralph H. Hamilton property line (Deed Book 1220 at Page 990) with the line of the tract out of which this Conservation Easement is delineated (Deed Book 814 at Page 82 of the Sampson County Registry), South 89 degrees 49 minutes 57 seconds East, 74.25 feet to a new iron stake and cap; thence the Easement line, South 06 degrees 50 minutes 04 seconds East, 206.49 feet to a new iron stake and cap; and South 14 degrees 40 minutes 46 seconds West, 40.72 feet to a new iron stake and cap, a corner in the line of the Frances J. Hamilton Heirs; thence with the line of the Frances J. Hamilton Heirs, North 70 degrees 15 minutes 05 seconds West, 131.07 feet to an existing iron stake in the centerline of a ditch, a control corner, and a corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence with the line of that Hamilton Heirs tract, North 09 degrees 52 minutes 14 seconds East, 203.36 feet to the **BEGINNING,** containing .545 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

EASEMENT TWO:

BEGINNING at a new iron stake and cap, a new corner within the tract out of which this Conservation Easement is delineated (Deed Book 814 at Page 82 of the Sampson County Registry), said iron stake and cap being located said iron stake being located South 26 degrees 58 minutes 29 seconds West, 3008.41 feet; South 09 degrees 52 minutes 14 seconds West 203.36 feet; South 70 degrees15 minutes 05 seconds East, 131.07 feet; and South 70 degrees 15 minutes 05 seconds East, 1051.30 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and running thence a new line, the Easement line, North 042155East, 34.23 feet to a new iron stake and cap; thence continuing the Easement line, South 70 degrees 15 minutes 05 seconds East, 478.56 feet to a new iron stake and cap; thence South 19 degrees 44 minutes 55 seconds West, 33 feet to a new iron stake and cap, a corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry); thence with the Hamilton Heirs and the edge of a ditch, North 70 degrees 15 minutes 05 seconds West, 469.48 feet to the beginning, containing .359 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE RALPH H. HAMILTON PROPERTY – SHEET 13 of 14
S. P. O. File # 82-S
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

BEGINNING at a new iron stake and cap, a control corner, a new corner in the line of the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and a new corner in the line of the tract of Ralph H. Hamilton, out of which this Conservation Easement is delineated (Deed Book 1220 at Page 990 and Map Book 29 at Page 4 of the Sampson County Registry), said iron stake and cap being located South 26 degrees 22 minutes 52 seconds West, 2921.32 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and running thence the Easement line, South 06 degrees 50 minutes 04 seconds East, 64.70 feet to a new iron stake and cap in Ralph H. Hamilton's line and also in the line of adjoining property of Ralph H. Hamilton (Deed Book 814 at Page 82 of the Sampson County Registry); then with Ralph H. Hamilton's line, North 89 degrees 49 minutes 57 seconds West, 74.25 feet to an existing iron stake, a control corner, and another corner with the Frances J. Hamilton Heirs; thence the joint Ralph H. Hamilton and Hamilton Heirs line, North 46 degrees 06 minutes 30 seconds East, 92.35 feet to the **BEGINNING,** containing .055 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

STATE OF NORTH CAROLINA

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

SAMPSON COUNTY

SPO File Number: 82-AI
EEP Project Number: 95718

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 _____day of _____, **2014**, by **MARY LILY JOHNSON NUCKOLLS and husband, JAMES GARLAND NUCKOLLS; JAMES GARLAND NUCKOLLS, JR. and wife, DAWN MURRELL NUCKOLLS; STEPHEN WITHEROW NUCKOLLS and wife, ANNE HILL NUCKOLLS; FAISON NUCKOLLS DANA and husband, MATTHEW PAUL DANA; SUSAN JOHNSON FORDHAM and husband, HENRY CLENDENIN FORDHAM, JR.; and ELLEN JOHNSON BAILEY and husband, RHETT ASHLEY BAILEY**, ("**Grantors**"), whose mailing address is **2347 Pattons Mill Lane, Galax, VA 24333**, 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 Ecosystem Enhancement Program (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 **ENVIRONMENTAL**

BANC & EXCHANGE, LLC, 909 CAPABILITY DR. SUITE 3100, RALEIGH, NC 27606, 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 005011.

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 Ecosystem Enhancement Program 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, Grantors own in fee simple certain real property situated, lying, and being in **SOUTH CLINTON TOWNSHIP, SAMPSON COUNTY, NORTH CAROLINA** (the "**Property**"), and being more particularly described as the following:

> A certain parcel of land containing approximately 112 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 1807 at Page 489** of the Sampson County Registry, North Carolina.

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 **GREAT COHARIE CREEK, A TRIBUTARY OF THE CAPE FEAR RIVER.**

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 AREAS CONSIST OF THE FOLLOWING:

Sampson County PIN # 15054464002; Sheets 2, 3, & 4 of 14 containing a total of **6.257 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-AI, EEP Site No. 95718, **THE NUCKOLLS, ET ALS. PROPERTY**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

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.

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. **Vegetative Cutting.** Except 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.

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.

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. Ecosystem Enhancement Program, 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 subterraneous 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:**

Ecosystem Enhancement 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 Grantors have hereunto set their hands and seals, the day and year first above written.

_____(SEAL)
MARY LILY JOHNSON NUCKOLLS

_____(SEAL)
JAMES GARLAND NUCKOLLS

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County, _____, certify that **Mary Lily Johnson Nuckolls and James Garland Nuckolls** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

_____(SEAL)
JAMES GARLAND NUCKOLLS, JR.

_____(SEAL)
DAWN MURRELL NUCKOLLS

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County, _____, certify that **James Garland Nuckolls, Jr. and Dawn Murrell Nuckolls** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

_____(SEAL)
STEPHEN WITHEROW NUCKOLLS

_____(SEAL)
ANNE HILL NUCKOLLS

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County, _____, certify that **Stephen Witherow Nuckolls and Anne Hill Nuckolls** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

_____(SEAL)
FAISON NUCKOLLS DANA

_____(SEAL)
MATTHEW PAUL DANA

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County, _____, certify that **Faison Nuckolls Dana and Matthew Paul Dana** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

_____(SEAL)
SUSAN JOHNSON FORDHAM

_____(SEAL)
HENRY CLENDENIN FORDHAM, JR.

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County North Carolina, certify that **Susan Johnson Fordham and Henry Clendenin Fordham, Jr.** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

_____(SEAL)
ELLEN JOHNSON BAILEY

_____(SEAL)
RHETT ASHLEY BAILEY

STATE OF _____

COUNTY OF _____

I, _____, a Notary Public for _____, County North Carolina, certify that **Ellen Johnson Bailey and Rhett Ashley Bailey** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

SEAL

My commission expires: _____ _____
NOTARY PUBLIC

Exhibit A

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE NUCKOLLS, ET ALS. PROPERTY – SHEETS 2, 3 AND 4 of 14
S. P. O. File # 82-AI
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

BEGINNING at a point in the Western edge of a Water Transmission Line Easement between Sampson County Water & Sewer District II and Frances Faison Johnson, et als. (Deed Book 1545 at Page 316 of the Sampson County Registry), said point being located South 06 degrees 57 minutes 35 minutes 5690.87 feet from NCGS Station "CTZ A 2006" – N=446,890.3004 and E=2,190,822.1341 (NAD 83/2011), said point being located in the centerline of Cedar Creek, and also being a joint corner with William M. Bennett, as mapped, (Deed Book 874 at Page 756 of the Sampson County Registry), now Ralph H. Hamilton (Deed Book 1878 at Page 824 of the Sampson County Registry), and running thence with the Western line of said Water Transmission Line Easement, said Easement lying approximately parallel to the Western right of way of Boykin Bridge Road (NCSR 1214), South 21 degrees 45 minutes 06 seconds West, 7.83 feet; and South 21 degrees 11 minutes 30 seconds West, 65.95 feet to an iron stake and cap set, a new corner within the Mary Lily Johnson Nuckolls, et als. Tract out of which this Conservation Easement is delineated (Deed Book 1807 at Page 489 and Map Book 14 at Page 10 of the Sampson County Registry); thence leaving the Water Transmission Line Easement and proceeding a new line the following courses and distances: North 55 degrees 02 minutes 35 minutes West, 79.59 feet to an iron stake and cap set, a control corner; North 87 degrees 21 minutes 31 seconds West, 51.38 feet to an iron stake and cap set; North 56 degrees 29 minutes 20 seconds West, 80.68 feet to an iron stake and cap set; North 48 degrees 39 minutes 18 seconds West, 259.29 feet to an iron stake and cap set; North 27 degrees 33 minutes 26 seconds West, 333.02 feet to an iron stake and cap set; North 22 degrees 03 minutes 17 minutes, 481.84 feet to an iron stake and cap set; North 42 degrees 43 minutes 18 seconds West, 296.97 feet to an iron stake and cap set; North 38 degrees 18 minutes 57 seconds West, 659.77 feet to an iron stake and cap set; North 18 degrees 43 minutes 42 seconds West, 101.50 feet to an iron stake and cap set; North 65 degrees 16 minutes 56 seconds West, 367.33 feet to an iron stake and cap set, a control corner set in the line of Ralph H. Hamilton (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry); thence with the Ralph Hamilton line, North 08 degrees 41 minutes 36 seconds East, 112.32 feet to an existing iron stake on the bank of Cedar Creek; thence North 08 degrees 41 minutes 36 seconds East, 10.15 feet to the centerline of the run of Cedar Creek, a corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry); thence with the centerline of the run of Cedar Creek, with the Frances J. Hamilton Heirs' line, the following courses and distances: South 31 degrees 59 minutes East, 13.78 feet; South 45 degrees 44 minutes 37 minutes East, 13.92 feet; South 66 degrees 40 minutes 10 seconds East, 11.06 feet; South 72 degrees 48 minutes 56 seconds East, 37.71 feet; South 62 degrees 42 minutes 01 seconds East, 14.94 feet; South 48 degrees 01 minute 12 seconds East, 12.98 feet; South 46 degrees 26 minutes27 seconds East, 30.69 feet; South 50 degrees 37 minutes 32 seconds East, 19.14 feet; North 34 degrees 46 minutes 27 seconds East, 24 feet; North 14 degrees 12 minutes 31 seconds, 15.23 feet; North 36 degrees 08 minutes 12 seconds, 8.99 feet; North 77 degrees 37 minutes 28 seconds East, 12.99 feet; South 68 degrees 25 minutes 34 seconds East, 11.54 feet; South 67 degrees 41 minutes 41 seconds East, 26.87 feet; South 35 degrees 14 minutes 05 seconds East, 21.64 feet; South 30 degrees 13 minutes 36 seconds East, 24.16 feet; South 59 degrees 23 minutes 30 seconds East, 19.39 feet; South 57 degrees 34 minutes 46 seconds East, 11.21 feet; South 29 degrees 04 minutes 52 seconds East, 15.95 feet; South 33 degrees 52 minutes 19 seconds, 23.09 feet; South 82 degrees 54 minutes 29 seconds, 16.99 feet; North 82 degrees 17 minutes 21 seconds East, 17.22 feet; North 89 degrees 03 minutes 16 seconds East, 10.46 feet; South 69 degrees 41 minutes 32 seconds East, 13.41 feet; South 76 degrees 49 minutes 27 seconds East, 40.96 feet; South 89 degrees 10 minutes 14 seconds East, 12.74 feet; North 80

degrees 12 minutes 48 seconds East, 10.76 feet; North 25 degrees 11 minutes 33 seconds East, 13.52 feet; South 88 degrees 24 minutes 37 seconds East, 11.30 feet; South 89 degrees 44 minutes 46 seconds East, 5.71 feet; South 53 degrees 52 minutes 31 seconds East, 8.54 feet; South 50 degrees 11 minutes 05 seconds East, 11.62 feet; South 25 minutes 49 minutes 39 seconds East, 12.76 feet; South 01 degrees 04 minutes 23 seconds East, 22.19 feet; South 03 degrees 43minutes 16 seconds East, 16.6 feet; South 06 degrees 53 minutes 30 seconds East, 26.41 feet; South 12 degrees 16 minutes 44 seconds East, 6.55 feet; South 30 degrees 35 minutes 44 seconds East, 24.07 feet; South 07 degrees 35 minutes 40 seconds East, 22.30 feet; South 12 degrees 54 minutes 31 seconds West, 18.35 feet; South 35 degrees 25 minutes 54 seconds West, 12.96 feet; South 05 degrees 26 minutes 39 seconds West, 16.21 feet; South 09 degrees 03 minutes 33 seconds East, 9.86 feet; South 58 degrees 17 minutes 08 seconds East, 8.90 feet; South 60 degrees 16 minutes 00 seconds East, 15.93 feet; South 79 degrees 26 minutes 47 seconds East, 26.89 feet; South 55 degrees 48 minutes 18 seconds East, 12.43 feet; South 24 degrees 10 minutes48 seconds East, 12.02 feet; South 35 degrees 44 minutes 57 seconds East, 31.48 feet; South 35 degrees 09 minutes 02 second East, 25.59 feet; South 33 degrees 42 minutes52 seconds East, 21.24 feet; South 18 degrees 46 minutes02 seconds East, 22.51 feet; South 29 degrees 36 minutes59 seconds East, 15.05 feet; South 43 degrees 06 minutes 52 seconds East, 17.15 feet; South 45 degrees 30 minutes42 seconds East, 18.32 feet; South 56 degrees 07 minutes 33 seconds East, 21.35 feet; South 24 degrees 05 minutes 08 seconds East, 24.61 feet; South 39 degrees 46 minutes 35 seconds East, 29.33 feet; South 63 degrees 06 minutes 32 seconds East, 16.36 feet; South 67 degrees 12 minutes38 seconds East, 14.90 feet; South 69 degrees 47 minutes 54 seconds East, 12.05 feet; South 47 degrees 57 minutes 21 seconds East, 27.92 feet; South 54 degrees 41minutes 24 seconds East, 20.36 feet; South 33 degrees 15 minutes 33 seconds East, 19.44 feet; South 31 degrees 24 minutes 02 seconds East, 13.43 feet; South 60 degrees 04 minutes 01 seconds East, 18.63 feet; South 26 degrees 37 minutes 37 seconds East, 22.13 feet; South 19 degrees 42 minutes 34 seconds East, 24.70 feet; South 15 degrees 55 minutes 00 seconds East, 20.51 feet; South 10 degrees 08 minutes 19 seconds East, 30.70 feet; South 42 degrees 49 minutes 10 seconds East, 19.30 feet; South 52 degrees 43 minutes 10 seconds East, 21.67 feet; South 09 degrees 25 minutes 31 seconds East, 14.33 feet; South 02 degrees 10 minutes 23 seconds West, 31.75 feet; South 34 degrees 50 minutes 59 seconds East, 13.21 feet; South 60 degrees 38 minutes 46 seconds East, 16.36 feet; South 73 degrees 44 minutes 42 seconds East, 19.21 feet; South 36 degrees 50 minutes 59 seconds East, 17.24 feet; South 24 degrees 14minutes 56 seconds East, 21.73 feet; South 42 degrees 43 minutes 55 seconds East, 17.17 feet; South 49 degrees 29 minutes 41 seconds East, 50.71 feet; South 47 degrees 47 minutes 52 seconds East, 21.63 feet; South 33 degrees 22 minutes 01 seconds East, 21.23 feet; and South 33 degrees 44 minutes 07 seconds East, 9.68 feet, a joint corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry), Mary Lily Johnson Nuckolls, et als. (Deed Book 1807 at Page 489 and Map Book 14 at Page 10 of the Sampson County Registry), and William M. Bennett as mapped (Deed Book 874 at Page 756 of the Sampson County Registry), now Ralph H. Hamilton (Deed Book 1878 at Page 824 of the Sampson County Registry); thence continuing with the joint Nuckolls, et als. and Bennett line, with the centerline of Cedar Creek, the following courses and distances: South 33 degrees 44 minutes 07 seconds East, 3.62 feet; South 45 degrees 49 minutes 43 seconds East, 12.61 feet; South 74 degrees 44 minutes 51 seconds East, 14.74 feet; South 57 degrees 38 minutes 45 seconds East, 27.59 feet; South 37 degrees 29 minutes 35 seconds East, 48.45 feet; South 41 degrees 34 minutes 56 seconds East, 23.66 feet; South 11 degrees 43 minutes 32 seconds East, 17.89 feet; South 02 degrees 31minutes 36 seconds West, 10.60 feet; South 18 degrees 13 minutes 37 seconds East, 13.14 feet; South 11 degrees 42 minutes 32 seconds East, 17.89 feet; South 02 degrees 31 minutes 36 seconds West, 10.60; South 18 degrees 13 minutes 37 seconds East, 13.14 feet; South 23 degrees 07 minutes 12 seconds East, 34.53 feet; South 25 degrees 26 minutes 08 seconds East, 24.81 feet; South 15 degrees 52 minutes 01 second East, 26.21 feet; South 29 degrees 14 minutes 19 seconds East, 47.18 feet; South 11 degrees 29 minutes 43 seconds East, 24.01 feet; South 08 degrees 56 minutes 09 seconds East, 29.86 feet; South 22 degrees 36 minutes 39 seconds East, 50.22 feet; South 11 degrees 36 minutes 08 seconds East, 45.27 feet; South 24 degrees 05 minutes 26 seconds East, 43.49 feet ; South 31 degrees 21 minutes 57 seconds East, 31.52 feet; South 18 degrees 55 minutes 04 seconds East, 19.21 feet; South 02 degrees 36 minutes 28 seconds East, 25.84 feet; South 23 degrees 10 minutes 01 second East, 25.94 feet; South 26 degrees 39 minutes 27 seconds East, 41.23 feet; South 22 degrees 39 minutes 09 seconds East, 21.85 feet; South 22 degrees 49 minutes 42 seconds East, 21.57 feet; South 36 degrees 17 minutes 44 seconds East, 51.81 feet; South 25 degrees 09 minutes 49 seconds East, 49.07 feet; South 46 degrees 54 minutes 09 seconds East, 13.84 feet; South

29 degrees 34 minutes 49 seconds East, 32.84 feet; South 30 degrees 02 minutes 47 seconds East, 49.17 feet; South 28 degrees 35 minutes 43 seconds East, 49.00 feet; South 08 degrees 29 minutes 32 seconds East, 13.39 feet; South 15 degrees 23 minutes 29 seconds East, 9.50 feet; South 17 degrees 56 minutes 49 seconds East, 13.02 feet; South 62 degrees 03 minutes 35 seconds East, 13.46 feet; South 52 degrees 19 minutes 58 seconds East, 45.18 feet; South 35 degrees 47 minutes 45 seconds East, 26.18 feet; South 65 degrees 48 minutes 13 seconds East, 23.46 feet; South 53 degrees 07 minutes 31 seconds East, 24.90 feet; South 48 degrees 52 minutes 58 seconds East, 24.43 feet; South 44 degrees 42 minutes 47 seconds East, 24.70 feet; South 51 degrees 42 minutes 24 seconds East, 27.23 feet; South 63 degrees 25 minutes 00 seconds East, 21.29 feet; South 70 degrees 06 minutes 59 seconds East, 22.77 feet; South 67 degrees 24 minutes 17 seconds East, 54.65 feet; South 54 degrees 39 minutes 01 second East, 32.10 feet; South 37 degrees 43 minutes 43 seconds East, 25.49 feet; South 59 degrees 41 minutes 51 seconds East, 19.40 feet; South 57 degrees 38 minutes 48 seconds East, 24.17 feet to the **BEGINNING,** containing 6.257 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

STATE OF NORTH CAROLINA

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

SAMPSON COUNTY

SPO File Number: 82-AY
EEP Project Number: 95718

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 _____day of _____, **2014**, by **ELEANOR HAMILTON LAMB and husband, EDWIN EARL LAMB; BILLIE HAMILTON DEVANE and husband ROBERT M. DEVANE; JAMES LEE HAMILTON, SINGLE; RALPH HARVEY HAMILTON, SINGLE; JOHNNY EARLIE HAMILTON and wife, MARGARET S. HAMILTON** ("**Grantors**"), whose mailing address is **110 Shell Lane, Clinton, NC 28328**, 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 Ecosystem Enhancement Program (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 **ENVIRONMENTAL BANC & EXCHANGE, LLC, 909 CAPABILITY DR. SUITE 3100, RALEIGH, NC 27606,** 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 005011.

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 Ecosystem Enhancement Program 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, Grantors own in fee simple certain real property situated, lying, and being in **SOUTH CLINTON TOWNSHIP, SAMPSON COUNTY, NORTH CAROLINA** (the "**Property**"), and being more particularly described as the following:

1. A certain parcel of land containing approximately 31.8 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 915 at Page 163** of the Sampson County Registry, North Carolina;
2. A certain parcel of land containing approximately 3.277 acres and being conveyed to the Grantor by deeds as recorded in **Deed Book 704 at Page 150, Deed Book 733 at Page 298,** and **Deed Book 752 at Page 729,** all of the Sampson County Registry, North Carolina;
3. A certain parcel of land containing approximately 114.67 acres and being conveyed to the Grantor by deeds as recorded in **Deed Book 704 at Page 150, Deed Book 733 at Page 298,** and **Deed Book 752 at Page 729,** all of the Sampson County Registry, North Carolina;

4. A certain parcel of land containing approximately 7.63 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 955 at Page 767** of the Sampson County Registry, North Carolina;

THE GRANTORS NAMED HEREIN ARE ALL OF THE HEIRS AT LAW OF FRANCES J. HAMILTON.

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 **GREAT COHARIE CREEK, A TRIBUTARY OF THE CAPE FEAR RIVER.**

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 AREAS CONSIST OF THE FOLLOWING:

A. Sampson County PIN # 15041612003; Sheets 7, 8, & 9 of 14 (Area 1 – **7.805 acres** and Area 2 – **1.907 acres**) containing a total of **9.712 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-Y, EEP Site No. 95718, **THE FRANCES J. HAMILTON HEIRS PROPERTY**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

B. Sampson County PIN # 15041612004; Sheet 11 of 14 containing a total of **3.115 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-Y, EEP Site No. 95718, **THE FRANCES J. HAMILTON HEIRS PROPERTY**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

C. Sampson County PIN # 15041612005; Sheet 10 of 14 (Area 1 – **11.180 acres** and Area 2 – **0.844 acres**) containing a total of **12.024 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-Y, EEP Site No. 95718, **THE FRANCES J. HAMILTON HEIRS PROPERTY**," dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**, **PROFESSIONAL LAND SURVEYORS,** PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

D. Sampson County PIN# 15041610001; Sheet 14 of 14 containing a total of **2.682 acres,** as shown on the plats of survey entitled "Final Plat, Conservation Easement for North Carolina Ecosystem Enhancement Program, Project Name: Cedar Creek Stream and Wetland Restoration Project, SPO File No. 82-Y, EEP Site No. 95718, **THE JAMES L. HAMILTON, ET ALS. PROPERTY,** dated **FEBRUARY 24, 2014**, by **MATRIX EAST, PLLC**,

PROFESSIONAL LAND SURVEYORS, PLS Number L-4189 and recorded in the Sampson County, North Carolina Register of Deeds at **Plat Book _____ Page _____.**

A total of **27.533 acres** as described above.

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.

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. **Vegetative Cutting.** Except 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.

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.

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. Ecosystem Enhancement Program, 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 subterraneous 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:**

Ecosystem Enhancement 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 Grantors have hereunto set their hands and seals, the day and year first above written.

_____(SEAL)
ELEANOR HAMILTON LAMB

_____(SEAL)
BILLIE HAMILTON DEVANE

_____(SEAL)
JAMES LEE HAMILTON

_____(SEAL)
RALPH HARVEY HAMILTON

_____(SEAL)
JOHNNY EARLIE HAMILTON

_____(SEAL)
EDWIN EARL LAMB

_____(SEAL)
MARGARET S. HAMILTON

_____(SEAL)
ROBERT M. DEVANE

STATE OF NORTH CAROLINA

COUNTY OF SAMPSON

I, _____, a Notary Public for _____, County North Carolina, certify that **Ralph H. Hamilton** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

My commission expires: _____ _____ NOTARY PUBLIC

STATE OF NORTH CAROLINA

COUNTY OF _____

I, _____, a Notary Public for _____, County North Carolina, certify that **Eleanor Hamilton Lamb and Edwin Earl Lamb** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

My commission expires: _____ _____ NOTARY PUBLIC

STATE OF NORTH CAROLINA

COUNTY OF SAMPSON

I, _____, a Notary Public for _____, County North Carolina, certify that **Billie Hamilton Devane and Robert M. Devane** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

My commission expires: _____ _____ NOTARY PUBLIC

STATE OF NORTH CAROLINA

COUNTY OF SAMPSON

I, _____, a Notary Public for _____, County North Carolina, certify that **Johnnie Earlie Hamilton and Margaret S. Hamilton** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

My commission expires: _____ _____ NOTARY PUBLIC

STATE OF NORTH CAROLINA

COUNTY OF SAMPSON

I, _____, a Notary Public for _____, County North Carolina, certify that **James Lee Hamilton** personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this _____ day of _____**, 2014.**

My commission expires: _____ _____ NOTARY PUBLIC

Exhibit A

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE FRANCES J. HAMILTON HEIRS PROPERTY – SHEETS 7, 8 AND 9 of 14
S. P. O. File # 82-Y
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

EASEMENT ONE:

BEGINNING at a new iron stake and cap, a new corner within the Frances J. Hamilton Heirs' Tract (Deed Book 915 at Page 163 of the Sampson County Registry) out of which this Conservation Easement is delineated, a new corner in the line of William M. Bennett as mapped (Deed Book 874 at Page 756 of the Sampson County Registry), now Ralph H. Hamilton (Deed Book 1878 at Page 824 of the Sampson County Registry), and said new iron stake and cap being located, South 00 degrees 02 minutes 15 seconds West, 4502.67 feet from NCGS Station "CTZ A 2006" – N=446,890.3004 and E=2,190,822.1341 (NAD 83/2011), and running thence with the Bennett (now Hamilton) line, South 36 degrees 15 minutes 26 seconds West, 14.09 feet; South 41 degrees 55 minutes 57 seconds West, 36.90 feet; and South 34 degrees 20 minutes 19 seconds West, 36.54 feet to a point in the centerline of Cedar Creek, a joint corner with the Hamilton Heirs, Bennett (now Hamilton), and Mary Lily Johnson Nuckolls, et als. (Deed Book 1807 at Page 489 and Map Book 14 at Page 10 of the Sampson County Registry); thence with the Nuckolls, et als. line, the centerline of Cedar Creek, the following courses and distances: North 33 degrees 44 minutes 07 seconds West, 9.68 feet; North 33 degrees 22 minutes 01 seconds West, 21.23 feet; North 47 degrees 47 minutes 52 seconds West, 21.63 feet; North 49 degrees 29 minutes 41 seconds West, 50.71 feet; North 42 degrees 43 minutes 55 seconds West, 17.17 feet; North 24 degrees 14minutes 56 seconds West, 21.73 feet; North 36 degrees 50 minutes 59 seconds West, 17.24 feet; North 73 degrees 44 minutes 42 seconds West, 19.21 feet; North 60 degrees 38 minutes 46 seconds West, 16.36 feet; North 34 degrees 50 minutes 59 seconds West, 13.21 feet; North 02 degrees 10 minutes 23 seconds East, 31.75 feet; North 09 degrees 25 minutes 31 seconds West, 14.33 feet; North 52 degrees 43 minutes 10 seconds West, 21.67 feet; North 42 degrees 49 minutes 10 seconds West, 19.30 feet; North 10 degrees 08 minutes 19 seconds West, 30.70 feet; North 15 degrees 55 minutes 00 seconds West, 20.51 feet; North 19 degrees 42 minutes 34 seconds West, 24.70 feet; North 26 degrees 37 minutes 37 seconds West, 22.13 feet; North 60 degrees 04 minutes 01 seconds West, 18.63 feet; North 31 degrees 24 minutes 02 seconds West, 13.43 feet; North 33 degrees 15 minutes 33 seconds West, 19.44 feet; North 54 degrees 41minutes 24 seconds West, 20.36 feet; North 47 degrees 57 minutes 21 seconds West, 27.92 feet; North 69 degrees 47 minutes 54 seconds West, 12.05 feet; North 67 degrees 12 minutes 38 seconds West, 14.90 feet; North 63 degrees 06 minutes 32 seconds West, 16.36 feet; North 39 degrees 46 minutes 35 seconds West, 29.33 feet; North 24 degrees 05 minutes 08 seconds West, 24.61 feet; North 56 degrees 07 minutes 33 seconds West, 21.35 feet; North 45 degrees 30 minutes 42 seconds West, 18.32 feet; North 43 degrees 06 minutes 52 seconds West, 17.15 feet; North 29 degrees 36 minutes 59 seconds West, 15.05 feet; North 18 degrees 46 minutes 02 seconds West, 22.51 feet; North 33 degrees 42 minutes 52 seconds West, 21.24 feet; North 35 degrees 09 minutes 02 second West, 25.59 feet; North 35 degrees 44 minutes57 seconds West, 31.48 feet; North 24 degrees 10 minutes 48 seconds West, 12.02 feet; North 55 degrees 48 minutes 18 seconds West, 12.43 feet; North 79 degrees 26 minutes 47 seconds West, 26.89 feet; North 60 degrees 16 minutes 00 seconds West, 15.93 feet; North 58 degrees 17 minutes 08 seconds West, 8.90 feet; North 09 degrees 03 minutes 33 seconds West, 9.86 feet; North 05 degrees 26 minutes 39 seconds East, 16.21 feet; North 35 degrees 25 minutes 54 seconds East, 12.96 feet; North 12 degrees 54 minutes 31 seconds East, 18.35 feet; North 07 degrees 35 minutes 40 seconds West, 22.30 feet; North 30 degrees 35 minutes 44 seconds West, 24.07 feet; North 12 degrees 16 minutes 44 seconds West, 26.55 feet; North 06 degrees 53 minutes 30 seconds West, 26.41 feet; North 03 degrees 43minutes 16 seconds West, 16.6 feet; North 01 degrees 04 minutes 23 seconds West, 22.19 feet; North 25 minutes 49 minutes 39 seconds West, 12.76 feet; North 50 degrees 11 minutes 05 seconds

West, 11.62 feet; North 53 degrees 52 minutes 31 seconds West, 8.54 feet; North 89 degrees 44 minutes 46 seconds West, 5.71 feet; North 88 degrees 24 minutes 37 seconds West, 11.30 feet; South 25 degrees 11 minutes 33 seconds West, 13.52 feet; South 80 degrees 12 minutes 48 seconds West, 10.76 feet; North 89 degrees 10 minutes 14 seconds West, 12.74 feet; North 76 degrees 49 minutes 27 seconds West, 40.96 feet; North 69 degrees 41 minutes 32 seconds West, 13.41 feet; South 89 degrees 03 minutes 16 seconds West, 10.46 feet; South 82 degrees 17 minutes 21 seconds West, 17.22 feet; North 82 degrees 54 minutes 29 seconds West, 16.99 feet; North 33 degrees 52 minutes 19 seconds West, 23.09 feet; North 29 degrees 04 minutes 52 seconds West, 15.95 feet; North 57 degrees 34 minutes 46 seconds West, 11.21 feet; North 59 degrees 23 minutes 30 seconds West, 19.39 feet; North 30 degrees 13 minutes 36 seconds West, 24.16 feet; North 35 degrees 14 minutes 05 seconds West, 21.64 feet; North 67 degrees 41 minutes 41 seconds West, 26.87 feet; North 68 degrees 25 minutes 34 seconds West, 11.54 feet; South 77 degrees 37 minutes 28 seconds West, 12.99 feet; South 36 degrees 08 minutes 12 seconds West, 8.99 feet; South 14 degrees 12 minutes 31 seconds, West, 15.23 feet; South 34 degrees 46 minutes 21 seconds West, 24 feet; North 50 degrees 37 minutes 32 seconds West, 19.14 feet; North 46 degrees 26 minutes27 seconds West, 30.69 feet; North 48 degrees 01 minute 12 seconds West, 12.98 feet; North 62 degrees 42 minutes 01 seconds West, 14.94 feet; North 72 degrees 48 minutes 56 seconds West, 37.71 feet; North 66 degrees 40 minutes 10 seconds West, 11.06 feet; North 45 degrees 44 minutes 37 minutes West, 13.92 feet; North 31 degrees 59 minutes 00 seconds, West, 13.78 feet to a point, a joint corner with the Hamilton Heirs, Nuckols, et als, and Ralph H. Hamilton (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry); thence continuing the joint Hamilton Heirs and Hamilton line, the centerline of Cedar Creek, the following courses and distances: North 31 degrees 59 minutes 00 seconds West, 0.54 feet; North 52 degrees 48 minutes 10 seconds West, 28.05 feet; North 47 degrees 21 minutes 39 seconds West, 12.20 feet; North 84 degrees 00 minutes 50 seconds West, 9.72 feet; South 73 degrees 07 minutes 11 seconds West, 7.84 feet; North 89 degrees 34 minutes 38 seconds West, 12.45 feet; North 55 degrees 24 minutes 24 seconds West, 16.83 feet; South 89 degrees 13 minutes 16 seconds West, 18.76 feet; South 87 degrees 30 minutes 03 seconds West, 14.65 feet; South 55 degrees 37 minutes 24 seconds West, 27.44 feet; South 38 degrees 16 minutes 44 seconds West, 23.39 feet; South 29 degrees 56 minutes 49 seconds West, 18.55 feet; South 29 degrees 36 minutes 06 seconds West, 26.31 feet; South 44 degrees 42 minutes 04 seconds West, 14.17 feet; South 62 degrees 45 minutes 49 seconds West, 19.33 feet; North 59 degrees 48 minutes 53 seconds West, 24.50 feet; North 40 degrees 01 minutes 32 seconds West, 13.57 feet; North 70 degrees 38 minutes 18 seconds West, 18.24 feet; South 85 degrees 52 minutes 03 seconds West, 19.62 feet; North 86 degrees 53 minutes 08 seconds West, 27.00 feet; North 78 degrees 19 minutes 33 seconds West, 23.78 feet; North 79 degrees 12 minutes 11 seconds West, 14.40 feet; South 81 degrees 39 minutes 24 seconds West, 17.79 feet; South 80 degrees 39 minutes 33 seconds West, 53.75 feet; South 80 degrees 22 minutes 04 seconds West, 9.59 feet; North 78 degrees 53 minutes 01 seconds West, 10.33 feet; North 53 degrees 31 minutes 26 seconds West, 17.65 feet; North 35 degrees 44 minutes 47 seconds West, 18.48 feet; North 53 degrees 21 minutes 07 seconds West, 18.54 feet; North 47 degrees 38 minutes 42 seconds West, 13.40 feet; North 12 degrees 01 minutes 28 seconds West, 10.31 feet; North 05 degrees 21 minutes 14 seconds East, 9.87 feet; North 39 degrees 24 minutes 14 seconds East, 8.30 feet; North 33 degrees 16 minutes 47 seconds East, 10.81 feet; North 04 degrees 26 minutes 27 seconds East, 7.98 feet; South 10 degrees 47 minutes 05 seconds West, 5.52 feet; North 24 degrees 27 minutes 32 seconds West, 6.87 feeet; North 80 degrees 52 minutes 35 seconds West, 10.65 feet; North 88 degrees 11 minutes 55 seconds West, 3.96 feet; North 84 degrees 54 minutes 19 seconds West, 19.10 feet; North 75 degrees 36minutes 45 seconds West, 19.26 feet; North 19 degrees 26minutes 43 seconds West, 11.65 feet; North 07 degrees 12minutes 41 seconds West, 16.34 feet; North 09 degrees 02 minutes 26 seconds West, 17.62 feet; North 10 degrees 01 minutes 34 seconds East, 12.63 feet; North 32 degrees 20 minutes 31 seconds West, 8.34 feet; North 46 degrees 47 minutes 02 seconds West, 4.62 feet; thence leaving the main run of Cedar Creek and running with a branch and the Hamilton Heirs line the following courses and distances: North 34 degrees 58 minutes 27 seconds East, 30.32 feet; North 32 degrees 09 minutes 33 seconds East, 24.23 feet; North 15 degrees 20 minutes 23 seconds East, 39.50 feet; North 15 degrees

18 minutes 31 seconds East, 22.25 feet; North 13 degrees 04 minutes 42 seconds East, 45.73 feet; North 07 degrees 10 minutes 42 seconds East, 51.01 feet; North 13 degrees 29 minutes 24 seconds East, 50.13 feet; North 11 degrees 48 minutes 52 seconds East, 35.14 feet; North 05 degrees 15 minutes 55 seconds East, 14.96 feet; North 13 degrees 37 minutes 49 seconds East, 27.90 feet; North 02 degrees 36 minutes 34 seconds East, 23.42 feet; North 09 degrees 39 minutes 39 seconds East, 49.96 feet; North 15 degrees 40 minutes 33 seconds East, 17.87 feet; North 08 degrees 07 minutes 37 seconds East, 57.09 feet; North 16 degrees 29 minutes 40 seconds East, 9.94 feet; North 03 degrees 35 minutes 18 seconds West, 8.70 feet; North 14 degrees 44 minutes 49 seconds East, 7.55 feet; North 11 degrees 51 minutes 34 seconds East, 22.01 feet; and North 11 degrees 06 minutes 30 seconds East, 67.25 feet to an existing iron stake, a control corner, a joint corner with the Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry), the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and Ralph Harvey Hamilton (Deed Book 814 at Page 82 of the Sampson County Registry); thence with the Ralph Harvey Hamilton line, South 70 degrees 15 minutes 05 seconds East, 131.07 feet to a new iron stake and cap, a new corner within the Frances J. Hamilton Heirs' Tract (Deed Book 915 at Page 163 of the Sampson County Registry) out of which this Conservation Easement is delineated; thence a new line, the Easement line, South 14 degrees 40 minutes 46 seconds West, 490.63 feet to a new iron stake and cap; thence South 74 degrees 24 minutes 29 seconds East, 753.70 feet to a new iron stake and cap; thence North 73 degrees 48 minutes 24 seconds East, 328.92 feet to a new iron stake and cap, and said new iron stake and cap being located South 66 degrees 26 minutes 38 seconds West, 61.37 feet from a new iron stake and cap, a corner of Easement Two on this map; thence South 35 degrees 41 minutes 43 seconds East, 190.27 feet to a new iron stake and cap, a corner of an access area between Easements One and Two; thence South 77 degrees 36 minutes 29 seconds West, 152.45 feet to a new iron stake and cap; thence South 23 degrees 14 minutes 44 seconds West, 219.06 feet to a new iron stake and cap; thence South 39 degrees 43 minutes 03 seconds East, 418.26 feet to a new iron stake and cap; thence South 37 degrees 06 minutes 17 seconds East, 352.61 feet to the **BEGINNING,** containing 7.805 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

EASEMENT TWO:

BEGINNING at a new iron stake and cap, said new iron stake and cap being located South 00 degrees 02 minutes 15 seconds West, 4502.67 feet; North 37 degrees 06 minutes 17 seconds West, 352.61 feet; North 39 degrees 43 minutes 03 seconds West, 418.26 feet; North 23 degrees 14 minutes 44 seconds West, 219.06 feet; North 77 degrees 36 minutes 29 seconds East, 152.45 feet; North 35 degrees 41 minutes 43 seconds West, 190.27 feet; and North 66 degrees 26 minutes 38 seconds East, 61.37 feet from NCGS Station "CTZ A 2006" – N=446,890.3004 and E=2,190,822.1341 (NAD 83/2011), and said iron stake and cap being a new corner within the Frances J. Hamilton Heirs' Tract (Deed Book 915 at Page 163 of the Sampson County Registry) out of which this Conservation Easement is delineated, and running thence a new line, the Easement line, North 04 degrees 21 minutes 55 seconds East, 206.31 feet to a new iron stake and cap in the Ralph Harvey Hamilton line (Deed Book 814 at Page 82 of the Sampson County Registry); then with the Hamilton line and with a ditch, South 70 degrees 15 minutes 05 seconds East, 469.48 feet to a new iron stake and cap; thence leaving the Ralph Harvey Hamilton line, South 19 degrees 44 minutes 55 seconds West, crossing back over the ditch, 94.06 feet; thence North 84 degrees 28 minutes 26 seconds West, 189.32 feet to a new iron stake and cap; thence South 44 degrees 38 minutes 22 seconds West, 181.79 feet to a new iron stake and cap, a corner of an access area between Easements One and Two; thence crossing a ditch, North 35 degrees 41 minutes 43 seconds West, 187.87 feet to the **BEGINNING,** containing 1.907 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE FRANCES J. HAMILTON HEIRS PROPERTY – SHEET 10 of 14
S. P. O. File # 82-Y
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

EASEMENT ONE:

BEGINNING at a new iron stake and cap, said iron stake and cap being located South 35 degrees 35 minutes 56 seconds West, 3081.47 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), a new corner within the Frances J. Hamilton Heirs Tract out of which this Conservation Easement is delineated (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and running thence a new line, the Easement line, South 74 degrees 23 minutes 31 seconds East, 149.28 feet to a new iron stake and cap; thence another new line, the Easement line, North 38 degrees 43 minutes 50 seconds East, 436.77 feet to an existing concrete monument, a corner with James L. Hamilton, et als. (Deed Book 955 at Page 767 of the Sampson County Registry); thence with the Hamilton line, South 58 degrees 14 minutes 09 seconds East, 292.55 feet to an existing iron stake in the edge of a farm path; thence South 33 degrees 23 degree 19 seconds West, 59.97 feet to a new iron stake and cap, said iron stake and cap being located North 58 degrees 10 minutes 52 seconds West, 52.45 feet from an existing iron stake, a joint corner of the Ralph Harvey Hamilton property (Deed Book 1220 at Page 990 and Map Book 29 at Page 4 of the Sampson County Registry) and adjoining Frances J. Hamilton Heirs' Property (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence the joint Hamilton Heirs' line, North 58 degrees 10 minutes 52 seconds West, 207.23 feet to an existing iron stake in the centerline of a ditch; thence continuing the joint Hamilton Heirs' line, the center of the ditch, the following courses and distances: South 21 degrees 05 minutes 17 seconds West, 145.75 feet to an existing iron stake; South 45 degrees 54 minutes 32 seconds West, 377.83 feet to an existing iron stake; and South 36 degrees 13 minutes 44 seconds West, 150.87 feet to a point; thence continuing above the ditch, South 80 degrees 07 minutes 23 seconds East, 355.84 feet to an existing iron stake, a joint corner with Ralph Harvey Hamilton (Deed Book 814 at Page 82 of the Sampson County Registry) and adjoining property of The Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry); thence with the Frances J. Hamilton Heirs' line, South 11 degrees 06 minutes 30 seconds West, 67.25 feet to a point in the centerline of Cedar Creek; thence continuing with the Hamilton Heirs' line, and running with the centerline of Cedar Creek, the following courses and distances: South 11 degrees 51 minutes 34 seconds West, 22.01 feet; South14 degrees 44minutes 49 seconds West, 7.55 feet; South 03 degrees 35 minutes 18 seconds East, 8.70 feet; South 16 degrees 29 minutes 40seconds West, 9.94 feet; South 08 degrees 07 minutes 37 seconds West, 57.09 feet; South 15 degrees 40 minutes 33 seconds West, 17.87 feet; South 09 degrees 39 minutes 39 seconds West, 49.96 feet; South 02 degrees 36 minutes 34 seconds West, 23.42 feet; South 13 degrees 37 minutes 49 seconds West, 27.90 feet; South 05 degrees 15 minutes 55 seconds West, 14.96 feet; South 11 degrees 48 minutes 52 seconds West, 35.14 feet; South 13 degrees 29 minutes 24 seconds West, 50.13 feet; South 07 degrees 10minutes 42 seconds West, 51.01 feet; South 13 degrees 04minutes 42 seconds West, 45.73 feet; South 15 degrees 18 minutes 31 seconds West, 22.25 feet; South 15 degrees 20 minutes 23 seconds West, 39.50 feet; South 32 degrees 09 minutes 33 seconds West, 24.23 feet; South 34 degrees 58 minutes 27 seconds West, 30.32 feet to a fork in Cedar Creek, a joint corner with the two tracts of the Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry – and Deed Book 915 at Page 163 of the Sampson County Registry), and Ralph H. Hamilton (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry; thence with the Hamilton Heirs' (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry) and Ralph Hamilton joint line, continuing with the centerline of Cedar Creek, North 46 degrees 48 minutes 02 seconds West, 7.18 feet; North 48 degrees 48 minutes 50 seconds West, 35.38 feet; North 62 degrees 38 minutes 52 seconds West, 48.81 feet; North 62 degrees 44 minutes 19 seconds West, 13.70 feet; North 49 degrees 59 minutes 31 seconds West, 38.90 feet; North 54 degrees 38 minutes 26 seconds West, 33.68

feet; North 51 degrees 44 minutes 07 seconds West, 12.81 feet; North 53 degrees 22 minutes 01 seconds West, 34.43 feet; North 63 degrees 57 minutes 09 seconds West, 24.37 feet; North 56 degrees 02 minutes 58 seconds West, 20.95 feet; North 58 degrees 49 minutes 17 seconds West, 16.19 feet; North 75 degrees 09 minutes 51 seconds West, 12.50 feet; North 83 degrees 58 minutes 29 seconds West, 22.69 feet; North 85 degrees 02 minutes 21 seconds West, 54.13 feet; North 73 degrees 23 minutes 01 seconds West, 25.04 feet; North 72 degrees 06 minutes 16 seconds West , 21.93 feet; North 61 degrees27 minutes 59 seconds West, 51.46 feet; North 62 degrees 02 minutes 39 seconds West, 19.73 feet; North 61 degrees 30 minutes 07 seconds West, 18.77 feet; North 69 degrees 19 minutes 57 seconds West, 12.23 feet; North 81 degrees 24 minutes17 seconds West, 13.45 feet; North 86 degrees 16 minutes 32 seconds West, 34.56 feet; North78 degrees 04 minutes12 seconds West, 24.72 feet; North 73 degrees 41 minutes59secondsWest, 21.61 feet; North 80 degrees 46 minutes 28 seconds West, 31.14 feet; North 75 degrees35 minutes 15 seconds West, 17.89 feet; North 79 degrees 28 minutes 23 seconds West, 22.59 feet; North 88 degrees 47 minutes 13 seconds West, 26.00 feet; South 88 degrees 26 minutes 13 seconds West, 49.50 feet; North 78 degrees 58 minutes 00 seconds West, 22.93 feet; North85 degrees 59 minutes 39 seconds West, 29.26 feet; North 89 degrees 34 minutes 16 seconds West, 49.48 feet; North 87 degrees 20 minutes 51 seconds West ,49.24 feet; North 87 degrees 40 minutes 25 seconds West, 41.57 feet; North 87 degrees 44 minutes 31 seconds West 24.00 feet; North 81 degrees 19 minutes 13 seconds West, 29.45 feet; North 52 degrees 31 minutes 17 seconds West, 15.48 feet; North 27 degrees 57 minutes 53 seconds West, 24.78 feet, and North 14 degrees 25 minutes 41 seconds West, 7.88 feet; thence leaving Cedar Creek and running North 344 degrees 47 minutes 22 seconds East, 111.42 feet to a new iron stake and cap, a new corner within the Frances J. Hamilton Heirs Tract out of which this Conservation Easement is delineated (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence continuing, the Easement line, South 79 degrees 48 minutes 34 seconds East, 109.98 feet to a new iron stake and cap; North 74 degrees 28 minutes 20 seconds East, 250.27 feet to a new iron stake and cap; and North 28 degrees 26 minutes 52 seconds East, 590.43 feet to the **BEGINNING,** containing 11.180 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

EASEMENT TWO:

BEGINNING at a new iron stake and cap, said iron stake and cap being located South 35 degrees 35 minutes 56 seconds West, 3081.47 feet; South 28 degrees 26 minutes 52 seconds West, 590.43 feet; South 74 degrees 28 minutes 20 seconds West, 250.27 feet; North 79 degrees 48 minutes 34 seconds West, 109.98 feet; and North 53 degrees 43 minutes 27 seconds West, 60.67 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and being a new corner within the Frances J. Hamilton Heirs Tract out of which this Conservation Easement is delineated (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and running thence a new line, the Easement line, South 44 degrees 47 minutes 22 seconds West, 88.35 feet to a point in the branch, a corner with Ralph H. Hamilton (Deed Book 1148 at Page 985 and Map Book 1 at Page 306 of the Sampson County Registry); thence the joint Hamilton Heirs' and Hamilton line, running with the center of the branch, the following courses And distances: North 58 degrees 43 minutes 39 seconds West, 3.85 feet; South 88 degrees 30 minutes 15 seconds West, 8.57 feet; North 80 degrees 52 minutes 07 seconds West, 49.35 feet; North 83 degrees 51 minutes 02 seconds West, 51.27 feet; North 78 degrees 41 minutes 24 seconds West, 51.18 feet; North 63 degrees 56 minutes 22 seconds West, 48.07 feet; North 78 degrees 46 minutes 07 seconds West, 11.56 feet; North 80 degrees 35 minutes 21 seconds West, 7.90 feet; South 76 degrees 58 minutes 20 seconds West, 8.81 feet; South 63 degrees 32 minutes 40 seconds West, 9.70 feet; South 57 degrees 28 minutes 19 seconds West, 8.40 feet; South 48 degrees 07 minutes 03 seconds West, 13.44 feet; South 60 degrees 08 minutes 17 seconds West, 8.50 feet; South 68 degrees 12 minutes 35 seconds West, 6.71 feet; North 73 degrees 37 minutes 42 seconds West, 14.99 feet; North 64 degrees 33 minutes 16 seconds West, 36.40 feet; North 57 degrees 47 minutes 11 seconds West, 52.45 feet; North 46 degrees 30 minutes 07 seconds West, 19.86 feet; North 51 degrees 39 minutes 18 seconds West, 30.40 feet; North 53 degrees 44 minutes 53 seconds West, 1.21 feet; thence leaving the branch, North 38 degrees 39 minutes 40 seconds East, 16.72 feet to a new iron stake and cap, a new corner within the Frances J. Hamilton Heirs Tract out of which this Conservation Easement is delineated

(Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and running thence a new line, the Easement line, South 47 degrees 50 minutes 16 seconds East, 18.78 feet to a new iron stake and cap, another new corner; thence continuing the Easement line, North 42 degrees 09 minutes 44 seconds East, 72.34 feet to a new iron stake and cap, another new corner, and South 76 degrees 17 minutes 01 seconds East, 403.71 feet to the **BEGINNING,** containing .844 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE FRANCES J. HAMILTON HEIRS PROPERTY – SHEET 11 of 14
S. P. O. File # 82-Y
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

BEGINNING at an existing iron stake, a control corner, and a corner in the line of adjoining property of the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), said iron stake being located South 30 degrees 10 minutes 21 seconds West, 2660.25 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and running thence the Easement lines, South 58 degrees 10 minutes 52 minutes East, 207.23 feet to an existing iron stake, said iron stake being located North 58 degrees 10 minutes 52 seconds West, 52.45 feet from an existing iron stake, a corner of the Ralph Harvey Hamilton property (Deed Book 1220 at Page 990 and Map Book 29 at Page 4 of the Sampson County Registry); thence continuing the Easement lines, South 33 degrees 23 minutes 19 seconds West, 249.11 feet to a new iron stake and cap set in the joint Frances J. Hamilton Heirs and Ralph H. Hamilton line; thence again the joint line, South 46 degrees 06 minutes 30 seconds West, 92.35 feet to an existing iron stake in the centerline of a ditch, a joint corner with two Ralph H. Hamilton tracts (Deed Book 1220 at Page 990 and Map Book 29 at Page 4 of the Sampson County Registry and Deed Book 814 at Page 82 of the Sampson County Registry of the Sampson County Registry); thence with Ralph Harvey Hamilton (Deed Book 814 at Page 82 of the Sampson County Registry), the centerline of the ditch, South 09 degrees 52 minutes 14 seconds West, 203.36 feet to an existing iron stake, a joint corner between the Frances J. Hamilton Heirs, Ralph Harvey Hamilton (Deed Book 814 at Page 82 of the Sampson County Registry), and The Frances J. Hamilton Heirs (Deed Book 915 at Page 163 of the Sampson County Registry; thence with the Hamilton Heirs line (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), running above the ditch, North 80 degrees 07 minutes 23 seconds West, 355.84 feet to a point in the centerline of the ditch, a corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence with the Hamilton Heirs line and the ditch, the following courses and distances: North 36 degrees 13 minutes 44 seconds East, 150.87 feet to an existing iron stake; North 45 degrees 54 minutes 32 seconds East, 377.83 feet to an existing iron stake, a control corner; and North 21 degrees 05 minutes 17 seconds East, 145.75 feet to the **BEGINNING,** containing 3.115 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

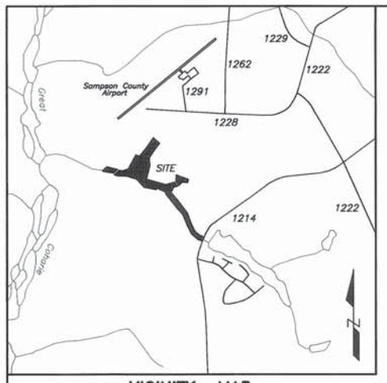
CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA
NCEEP PROJECT NAME: CEDAR CREEK SITE
THE JAMES L. HAMILTON, ET ALS. PROPERTY – SHEET 14 of 14
S. P. O. File # 82-Y
NCEEP RFP # 16-004365
NCEEP PROJECT # 95718

BEGINNING at a new iron stake and cap, a control corner, a corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry), and a new corner in the line of the tract of James L. Hamilton, et als. (Deed Book 955 at Page 767 of the Sampson County Registry), out of which this Conservation Easement is delineated, said iron stake and cap being located South 31 degrees 23 minutes 51 seconds West, 2182.66 feet from NCGS Station "CTZ A 2006" – N=446,890.3004; E=2,190,822.1341 (NAD83/2011), and running thence the Easement line, the following courses and distances: South 48 degrees 09 minutes 49 seconds East, 307.32 feet to a new iron stake and cap in the edge of a farm path; South 37 degrees 04 minutes 17 seconds West, 364.69 feet to an existing iron stake in the edge of the farm path, and said iron stake being located North 58 degrees 14 minutes 09 seconds West, 60.02 feet from an existing concrete monument on the Southeastern side of the farm path; thence North 58 degrees 14 minutes 09 seconds West, 292.55 feet to an existing concrete monument, a control corner, and a corner with the Frances J. Hamilton Heirs (Deed Book 704 at Page 150, Deed Book 733 at Page 298, and Deed Book 752 at Page 729 of the Sampson County Registry); thence the joint James L. Hamilton, et als. and Frances J. Hamilton Heirs line, North 35 degrees 01 minute 04 seconds East, 417.54 feet to the **BEGINNING,** containing 2.682 acres, more or less, as shown on a map prepared by Matrix East, PLLC, Professional Land Surveyors, February 24, 2014.

APPENDIX B

Baseline Information Data

Cedar Creek USACE Routine Wetland Data Forms
Hydric Soil Assessment
Cedar Creek NCDWQ Stream Determination Data Forms
Reference Reach NCDWQ Stream Determination Data Forms
Channel Stability Assessment Form
EDR Report
Environmental Screening and Resource Agency Correspondence
- Cedar Creek CE
- Farmland Conversion Impact Rating (Form AD 1006)
- Cedar Creek Correspondence



VICINITY MAP
(NOT TO SCALE)

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____ ADMINISTRATOR

6-19-14
DATE

INDEX TO SHEETS			
PROPERTY NAME	SHEET NUMBER	SPO #	ACREAGE
MARY LILY JOHNSON NUCKOLLS, ET ALS.	SHEET 2 OF 14	82-AI	
MARY LILY JOHNSON NUCKOLLS, ET ALS.	SHEET 3 OF 14	82-AI	6.257
MARY LILY JOHNSON NUCKOLLS, ET ALS.	SHEET 4 OF 14	82-AI	
RALPH H. HAMILTON	SHEET 5 OF 14	82-S	4.865
RALPH H. HAMILTON	SHEET 6 OF 14	82-S	2.401
FRANCES J. HAMILTON HEIRS	SHEET 7 OF 14	82-AH	
FRANCES J. HAMILTON HEIRS	SHEET 8 OF 14	82-AH	9.712
FRANCES J. HAMILTON HEIRS	SHEET 9 OF 14	82-AH	
FRANCES J. HAMILTON HEIRS	SHEET 10 OF 14	82-AH	12.024
FRANCES J. HAMILTON HEIRS	SHEET 11 OF 14	82-AH	3.115
RALPH H. HAMILTON	SHEET 12 OF 14	82-S	0.904
RALPH H. HAMILTON	SHEET 13 OF 14	82-S	0.055
JAMES L. HAMILTON, ET ALS.	SHEET 14 OF 14	82-AH	2.682
			42.015 TOTAL

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

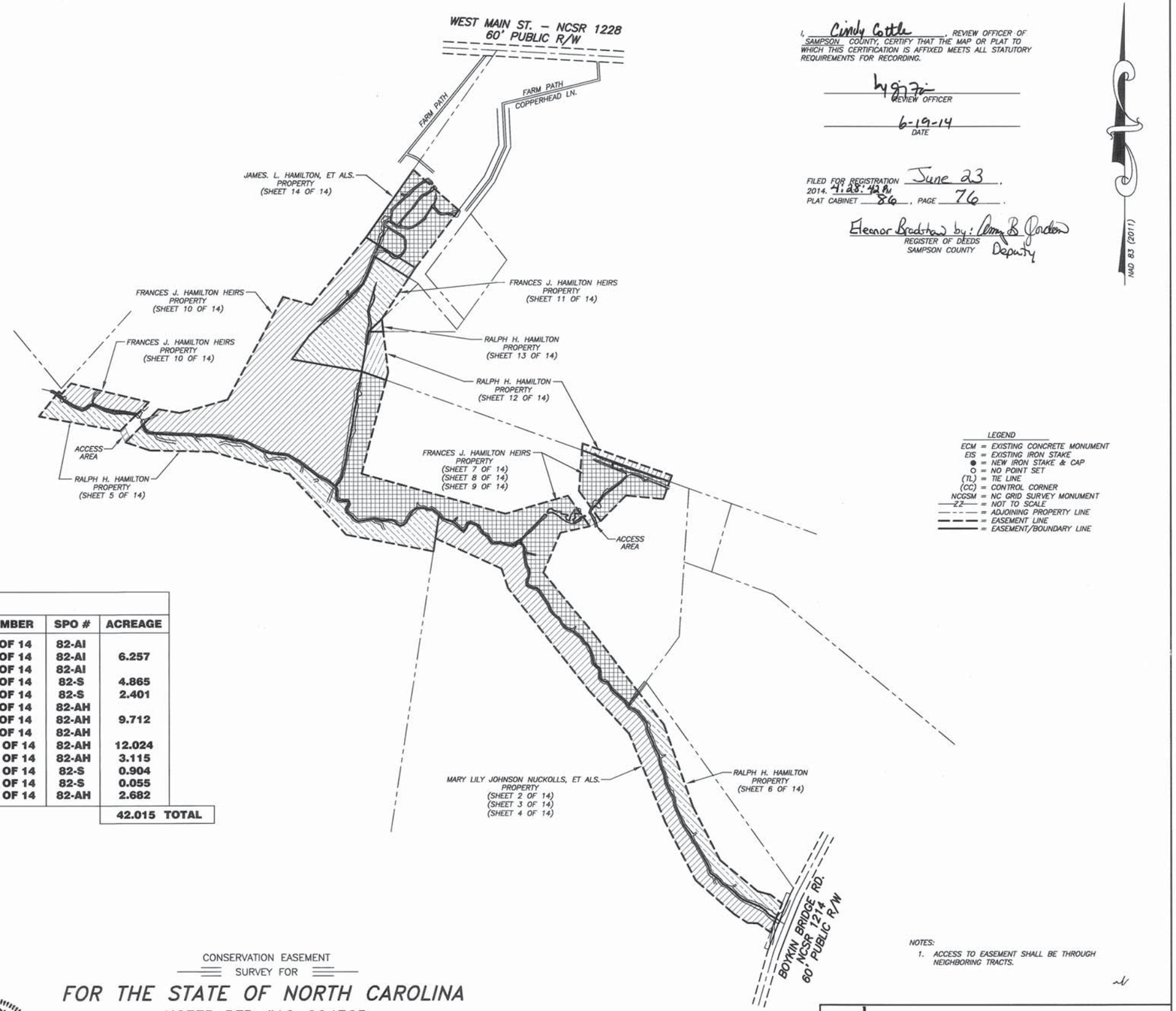
NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K PADERICK

CONSERVATION EASEMENT
SURVEY FOR

FOR THE STATE OF NORTH CAROLINA
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 350'

350' 175' 0 350' 700'
GRAPHIC SCALE



I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by _____ REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014, 11:28:42 AM
PLAT CABINET 86, PAGE 76.

Eleanor Bradshaw by: Amy B Jordan
REGISTER OF DEEDS Deputy
SAMPSON COUNTY

NAD 83 (2011)

LEGEND
ECM = EXISTING CONCRETE MONUMENT
EIS = EXISTING IRON STAKE
● = NEW IRON STAKE & CAP
○ = NO POINT SET
(TL) = TIE LINE
(CC) = CONTROL CORNER
NCGSM = NC GRID SURVEY MONUMENT
ZZ = NOT TO SCALE
= ADJOINING PROPERTY LINE
= EASEMENT LINE
= EASEMENT/BOUNDARY LINE

NOTES:
1. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

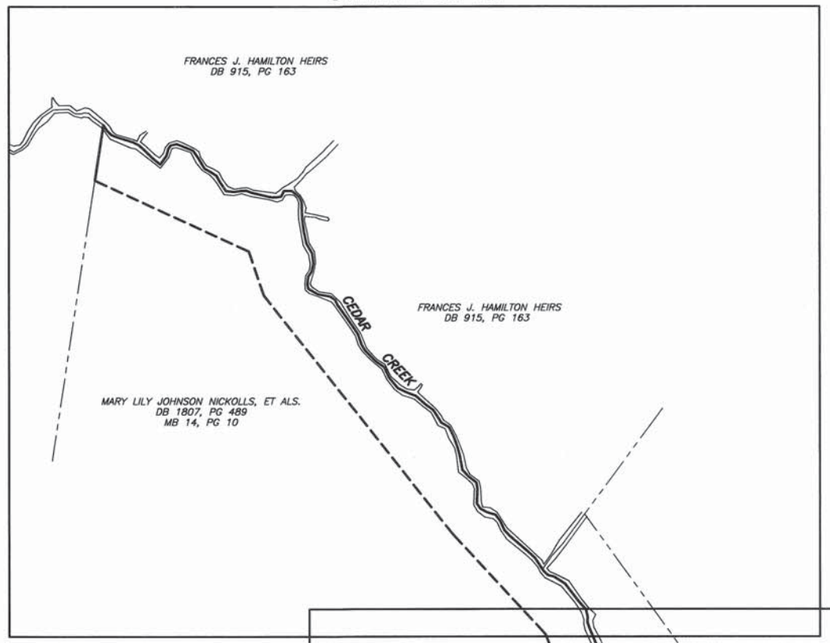
SHEET 1 OF 14

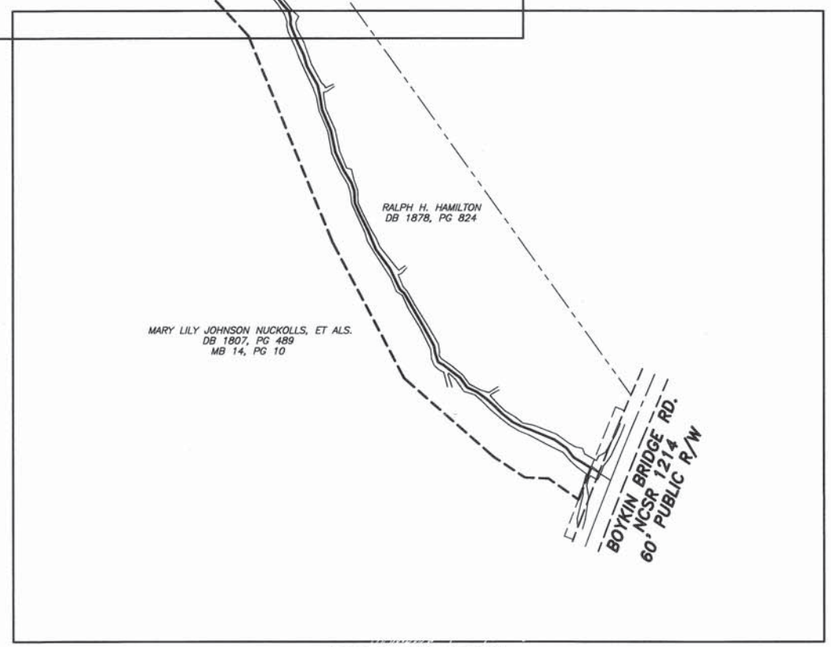
MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 350'	DRAWING NAME: S-1

Book 86 Page 76

SHEET 4 OF 14





SHEET 3 OF 14

I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

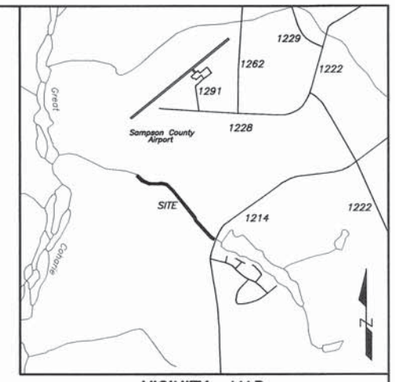
by _____
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014. 4:28:43 PM
PLAT CABINET C, PAGE 79.

Eleanor Bradshaw by: Lena B Gordon
REGISTER OF DEEDS Deputy
SAMPSON COUNTY

NAD 83 (2011)



VICINITY MAP
(NOT TO SCALE)

SOURCE OF TITLE
DB 1807, PG 489
MB 14, PG 10

ACREAGE DATA
(BY COMPUTER)
6.257 AC±

LEGEND
- EIS = EXISTING IRON STAKE
- EMN = EXISTING MAG NAIL
- ● = NEW IRON STAKE & CAP
- ○ = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____
ADMINISTRATOR

6-19-14
DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

SHEET 2 OF 14

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

OWNER 5/7/2014 DATE

CONSERVATION EASEMENT
SURVEY OF

THE NUCKOLLS, ET ALS. PROPERTY
FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AI
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 200'

200' 100' 0 200' 400'
GRAPHIC SCALE

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 200'	DRAWING NAME: S-2

Book 82 Page 79

LINE TABLE		
LINE	BEARING	LENGTH
L-1	S 06°57'35" E	5690.87
L-2	S 21°45'06" W	7.83
L-3	S 21°11'30" W	65.95
L-4	N 55°02'35" W	79.59
L-5	N 87°21'31" W	51.38
L-6	N 56°29'20" W	80.68
L-7	N 48°39'18" W	259.29
L-8	N 27°33'25" W	333.02
L-9	N 22°03'17" W	481.84
L-10	N 42°43'18" W	296.97
L-106	S 11°42'32" E	17.89
L-107	S 02°31'36" W	10.60
L-108	S 18°13'37" E	13.14
L-109	S 23°07'12" E	34.53
L-110	S 25°26'08" E	24.81
L-111	S 15°52'01" E	26.21
L-112	S 29°14'19" E	47.18
L-113	S 11°29'43" E	24.01
L-114	S 08°56'09" E	29.86
L-115	S 22°36'39" E	50.22
L-116	S 11°36'08" E	45.27
L-117	S 24°05'26" E	43.49
L-118	S 31°21'57" E	31.52
L-119	S 18°55'04" E	19.21
L-120	S 02°36'28" E	25.84
L-121	S 23°10'01" E	25.94
L-122	S 26°39'27" E	41.23
L-123	S 22°39'09" E	21.85
L-124	S 22°49'42" E	21.57
L-125	S 36°17'44" E	51.81
L-126	S 25°09'49" E	49.07
L-127	S 46°54'09" E	13.84
L-128	S 29°34'49" E	32.84
L-129	S 30°02'47" E	49.17
L-130	S 28°35'43" E	49.00
L-131	S 08°29'32" E	13.39
L-132	S 15°23'29" E	9.50
L-133	S 17°56'49" E	13.02
L-134	S 62°03'35" E	13.46
L-135	S 52°19'58" E	45.18
L-136	S 35°47'45" E	26.18
L-137	S 65°48'13" E	23.46
L-138	S 53°07'31" E	24.90
L-139	S 48°52'58" E	24.43
L-140	S 44°42'37" E	24.70
L-141	S 51°42'24" E	27.23
L-142	S 63°25'00" E	21.29
L-143	S 70°06'59" E	22.77
L-144	S 67°24'17" E	54.65
L-145	S 54°39'01" E	32.10
L-146	S 37°43'43" E	25.49
L-147	S 59°41'51" E	19.40
L-148	S 57°38'48" E	24.17

EASEMENT CORNER COORDINATE TABLE		
#	NORTHING	EASTING
1	441,234.0936'	2,191,508.7902'
2	441,172.6067'	2,191,484.9513'
3	441,218.2067'	2,191,419.7237'
4	441,220.5746'	2,191,368.3964'
5	441,265.1193'	2,191,301.1248'
6	441,436.4074'	2,191,106.4611'
7	441,731.6490'	2,190,952.3953'
8	442,178.2286'	2,190,771.4704'
14	441241.3657	2,191,511.6917'
15	441,254.2978'	2,191,491.2772'
16	441,264.0865'	2,191,474.5276'
17	441,284.2498'	2,191,458.9275'
18	441,302.8204'	2,191,432.7474'
19	441,323.8190'	2,191,382.2901'
20	441,331.5639'	2,191,360.8759'
21	441,341.0934'	2,191,341.8322'
22	441,357.9650'	2,191,320.4639'
23	441,375.5205'	2,191,303.0851'
24	441,391.5837'	2,191,284.6826'
25	441,406.5263'	2,191,264.7626'
26	441,416.1411'	2,191,243.3651'
27	441,437.3792'	2,191,228.0501'
28	441,464.9875'	2,191,192.2870'
29	441,471.2953'	2,191,180.3938'
30	441,483.6851'	2,191,176.3808'
31	441,492.8429'	2,191,173.8598'
32	441506.0875'	2,191,171.8822'
33	441,549.1150'	2,191,148.4275'
34	441,591.6734'	2,191,123.8105'
35	441,620.2310'	2,191,107.6006'
36	441,629.6881'	2,191,097.4936'
37	441,674.1027'	2,191,076.6282'
38	441,715.8622'	2,191,045.9579'
39	441,735.7463'	2,191,037.5878'
40	441,755.9109'	2,191,029.1724'
41	441,792.7612'	2,191,010.6729'
42	441,816.6093'	2,191,000.4679'
43	441,842.4176'	2,190,999.2925'
44	441,860.5944'	2,190,993.0629'
45	441,887.5104'	2,190,976.6554'
46	441,927.2170'	2,190,958.9016'
47	441,971.5596'	2,190,949.7975'
48	442,017.9192'	2,190,930.4895'
49	442,047.4126'	2,190,925.8520'
50	442,070.9428	2,190,921.0667'
51	442,112.1131'	2,190,898.0209'
52	442,137.3281'	2,190,890.8540'
53	442,159.7357'	2,190,880.1971'
54	442,191.4894'	2,190,866.6399'
55	442,203.9669'	2,190,862.5310'
56	442,214.5544'	2,190,862.9982'
57	442,232.0754'	2,190,859.3669'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

MARY LILY JOHNSON NUCKOLLS, ET ALS.
DB 1807, PG 489
MB 14, PG 10

RALPH H. HAMILTON
DB 1878, PG 824

CEDAR CREEK

MARY LILY JOHNSON NUCKOLLS, ET ALS.
DB 1807, PG 489
MB 14, PG 10

WATER TRANSMISSION LINE EASEMENT
DB 1545, PG 316

BOYKIN BRIDGE RD.
NCSR 1214
60' PUBLIC R/W

NCGSM "CTZ A 2006"
N=446,890.3004'
E=2,190,822.1341'
(NAD 83/2011)

NAD 83 (2011)

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

ADMINISTRATOR

6-19-14
DATE

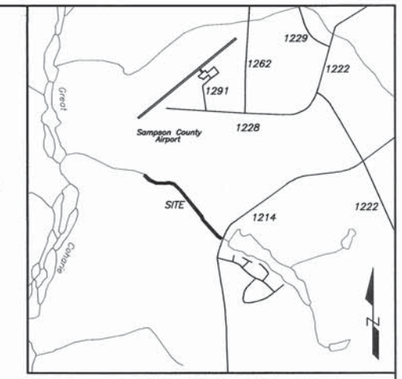
I, Cindy Cattle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014, 4:28:44 PM
PLAT CABINET 86, PAGE 78.

Eleanor B. Brockman by Ann B. Godwin
REGISTER OF DEEDS
SAMPSON COUNTY Deputy



VICINITY MAP
(NOT TO SCALE)

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

LEGEND
- R/W = RIGHT-OF-WAY
- C/L = CENTERLINE
- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- O = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

OWNER — 5/7/2014 DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL. THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

CONSERVATION EASEMENT
SURVEY OF

THE NUCKOLLS, ET ALS. PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AI
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 80'

80' 40' 0 80' 160'
GRAPHIC SCALE

SOURCE OF TITLE
DB 1807, PG 489
MB 14, PG 10

ACREAGE DATA (BY COMPUTER)
6.257 AC±

SHEET 3 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 80'	DRAWING NAME: S-3

Book 81 Page 19

SOURCE OF TITLE

DB 1807, PG 489
MB 14, PG 10

ACREAGE DATA (BY COMPUTER)

6.257 AC±

CERTIFICATE OF OWNERSHIP AND DEDICATION

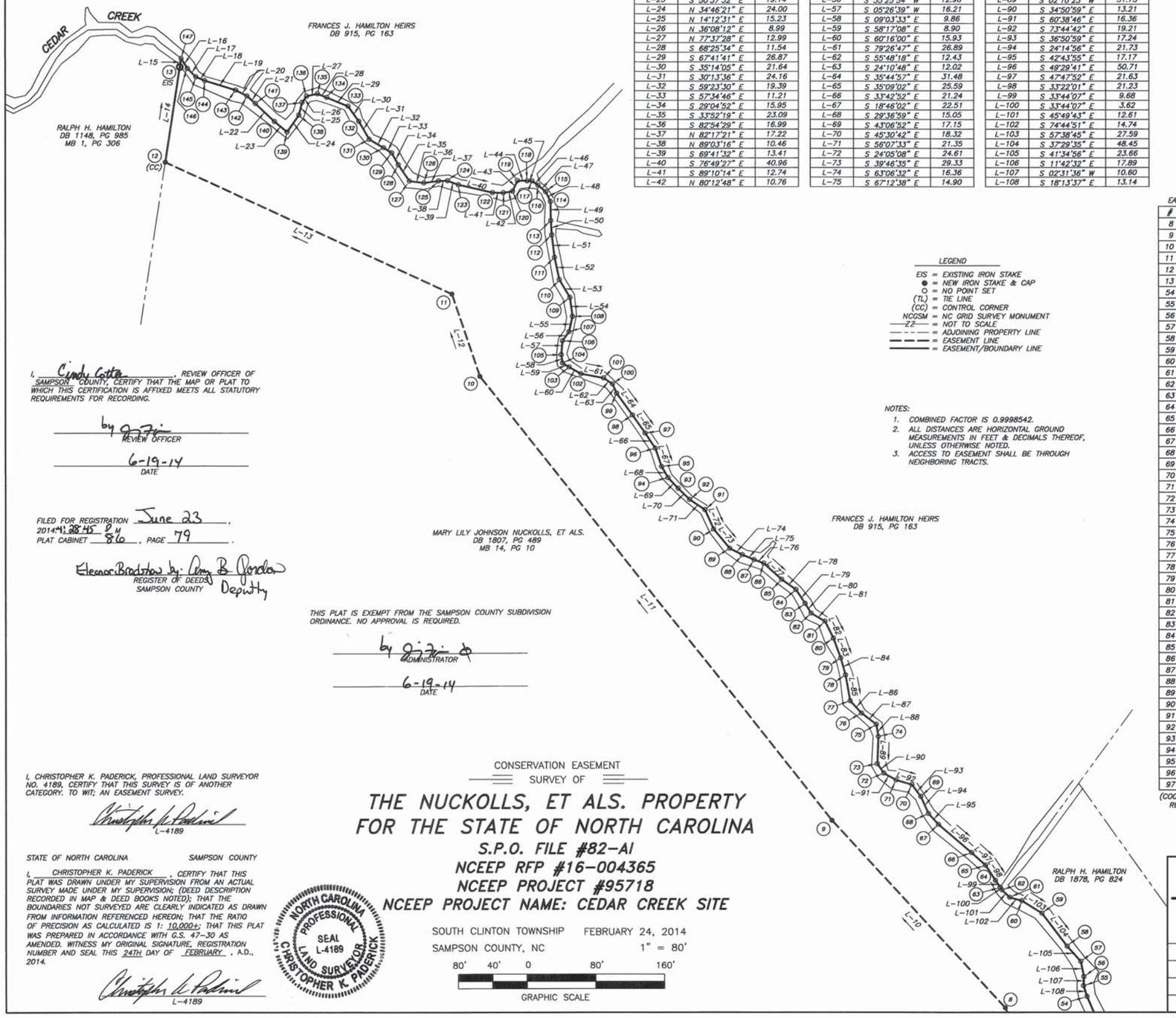
I HEREBY CERTIFY THAT I AM THE OWNER OF THE PROPERTY AS SHOWN AND DESCRIBED HEREON. I ALSO HEREBY ACCEPT AND ADOPT THIS RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

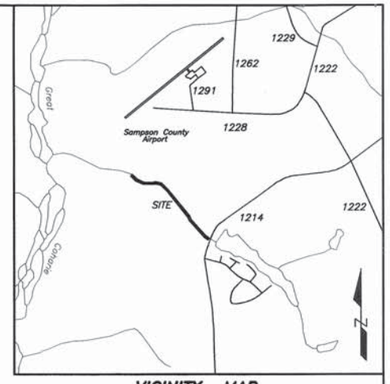
OWNER 5/7/2014 DATE

LINE TABLE		
LINE	BEARING	LENGTH
L-10	N 42°43'18" W	296.97
L-11	N 38°18'57" W	659.77
L-12	N 18°43'42" W	101.50
L-13	N 65°16'56" W	367.33
L-14	N 08°41'36" E	112.32
L-15	N 08°41'36" E	10.15
L-16	S 31°59'00" E	13.78
L-17	S 45°44'37" E	13.92
L-18	S 66°40'10" E	11.06
L-19	S 72°48'56" E	37.71
L-20	S 62°42'01" E	14.94
L-21	S 48°01'12" E	12.98
L-22	S 46°26'27" E	30.69
L-23	S 50°37'32" E	19.14
L-24	N 34°46'21" E	24.00
L-25	N 14°12'31" E	15.23
L-26	N 36°08'12" E	8.99
L-27	N 77°37'28" E	12.99
L-28	S 68°25'34" E	11.54
L-29	S 67°41'41" E	26.87
L-30	S 35°14'05" E	21.64
L-31	S 30°13'36" E	24.16
L-32	S 59°23'30" E	19.39
L-33	S 57°34'46" E	11.21
L-34	S 29°04'52" E	15.95
L-35	S 33°52'19" E	23.09
L-36	S 82°54'29" E	16.99
L-37	N 82°17'21" E	17.22
L-38	N 89°03'16" E	10.46
L-39	S 69°41'32" E	13.41
L-40	S 76°49'27" E	40.96
L-41	S 89°10'14" E	12.74
L-42	N 80°12'48" E	10.76

LINE TABLE		
LINE	BEARING	LENGTH
L-43	N 25°11'33" E	13.52
L-44	S 88°24'37" E	11.30
L-45	S 89°44'46" E	5.71
L-46	S 53°52'31" E	8.54
L-47	S 50°11'05" E	11.62
L-48	S 25°49'39" E	12.76
L-49	S 01°04'23" E	22.19
L-50	S 03°43'16" E	16.60
L-51	S 06°53'30" E	26.41
L-52	S 12°16'44" E	26.55
L-53	S 30°35'44" E	24.07
L-54	S 07°35'40" E	22.30
L-55	S 12°54'31" W	18.35
L-56	S 35°25'54" W	12.96
L-57	S 05°26'39" W	16.21
L-58	S 09°03'33" E	9.86
L-59	S 58°17'08" E	8.90
L-60	S 60°16'00" E	15.93
L-61	S 79°26'47" E	26.89
L-62	S 55°48'18" E	12.43
L-63	S 24°10'48" E	12.02
L-64	S 35°44'57" E	31.48
L-65	S 35°09'02" E	25.59
L-66	S 33°42'52" E	21.24
L-67	S 18°46'02" E	22.51
L-68	S 29°36'59" E	15.05
L-69	S 43°06'52" E	17.15
L-70	S 45°30'42" E	18.32
L-71	S 56°07'33" E	21.35
L-72	S 24°05'08" E	24.61
L-73	S 39°46'35" E	29.33
L-74	S 63°06'32" E	16.36
L-75	S 67°12'38" E	14.90

LINE TABLE		
LINE	BEARING	LENGTH
L-76	S 69°47'54" E	12.05
L-77	S 47°57'21" E	27.92
L-78	S 54°41'24" E	20.36
L-79	S 33°15'33" E	19.44
L-80	S 31°24'02" E	13.43
L-81	S 60°04'01" E	18.63
L-82	S 26°37'37" E	22.13
L-83	S 19°42'34" E	24.70
L-84	S 15°55'00" E	20.51
L-85	S 10°08'19" E	30.70
L-86	S 42°49'10" E	19.30
L-87	S 52°43'10" E	21.67
L-88	S 09°25'31" E	14.33
L-89	S 02°10'23" W	31.75
L-90	S 34°50'59" E	13.21
L-91	S 60°38'46" E	16.36
L-92	S 73°44'42" E	19.21
L-93	S 36°50'59" E	17.24
L-94	S 24°14'56" E	21.73
L-95	S 42°43'55" E	17.17
L-96	S 49°29'41" E	50.71
L-97	S 47°47'52" E	21.63
L-98	S 33°22'01" E	21.23
L-99	S 33°44'07" E	9.68
L-100	S 33°44'07" E	3.62
L-101	S 45°49'43" E	12.61
L-102	S 74°44'51" E	14.74
L-103	S 57°38'45" E	27.59
L-104	S 37°29'35" E	48.45
L-105	S 41°34'56" E	23.66
L-106	S 11°42'32" E	17.89
L-107	S 02°31'36" W	10.60
L-108	S 18°13'37" E	13.14





VICINITY MAP
(NOT TO SCALE)

LEGEND

- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- ○ = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

NOTES:

1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
8	442,178.2286'	2,190,771.4704'
9	442,396.4030'	2,190,569.9930'
10	442,914.0652'	2,190,160.9372'
11	443,010.1879'	2,190,128.3487'
12	443,163.7857'	2,189,794.6765'
13	443,274.8179'	2,189,811.6537'
54	442,191.4894'	2,190,866.6399'
55	442,203.9669'	2,190,862.5310'
56	442,214.5544'	2,190,862.9982'
57	442,232.0754'	2,190,859.3669'
58	442,249.7705'	2,190,843.6663'
59	442,288.2121'	2,190,814.1765'
60	442,302.9773'	2,190,790.8690'
61	442,306.8561'	2,190,776.6442'
62	442,315.6409'	2,190,767.6016'
63	442,318.6510'	2,190,765.5914'
64	442,326.7013'	2,190,760.2154'
65	442,344.4346'	2,190,748.5371'
66	442,358.9625'	2,190,732.5163'
67	442,391.8970'	2,190,693.9620'
68	442,404.5117'	2,190,682.3085'
69	442,424.3261'	2,190,673.3832'
70	442,438.1199'	2,190,663.0454'
71	442,443.4967'	2,190,644.6044'
72	442,451.5166'	2,190,630.3445'
73	442,462.3538'	2,190,622.7985'
74	442,494.0844'	2,190,624.0025'
75	442,508.2226'	2,190,621.6555'
76	442,521.3473'	2,190,604.4147'
77	442,535.5024'	2,190,591.2980'
78	442,565.7248'	2,190,585.8936'
79	442,585.4472'	2,190,580.2693'
80	442,608.6964'	2,190,571.9406'
81	442,628.4767'	2,190,562.0237'
82	442,637.7747'	2,190,545.8755'
83	442,649.2372'	2,190,538.8786'
84	442,665.4937'	2,190,528.2167'
85	442,677.2614'	2,190,511.6028'
86	442,695.9569'	2,190,490.8716'
87	442,700.1189'	2,190,479.5606'
88	442,705.8919'	2,190,465.8201'
89	442,713.2925'	2,190,451.2271'
90	442,735.8305'	2,190,432.4649'
91	442,758.2986'	2,190,422.4212'
92	442,770.1960'	2,190,404.6988'
93	442,783.0319'	2,190,391.6316'
94	442,795.5527'	2,190,379.9089'
95	442,808.6354'	2,190,372.4719'
96	442,829.9490'	2,190,365.2298'
97	442,847.6192'	2,190,353.4388'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
98	442,868.5421'	2,190,338.7063'
99	442,894.0933'	2,190,320.3127'
100	442,905.0575'	2,190,315.3898'
101	442,912.0453'	2,190,305.1056'
102	442,916.9705'	2,190,278.6697'
103	442,924.8729'	2,190,264.8340'
104	442,929.5514'	2,190,257.2631'
105	442,939.2910'	2,190,255.7102'
106	442,955.4264'	2,190,257.2480'
107	442,965.9877'	2,190,264.7623'
108	442,983.8693'	2,190,268.8606'
109	443,005.9749'	2,190,265.9133'
110	443,026.6950'	2,190,253.6617'
111	443,052.6381'	2,190,248.0152'
112	443,078.8593'	2,190,244.8460'
113	443,095.4287'	2,190,243.7684'
114	443,117.6181'	2,190,243.3528'
115	443,129.1073'	2,190,237.7919'
116	443,136.5468'	2,190,228.8676'
117	443,141.5795'	2,190,221.9723'
118	443,141.6048'	2,190,216.2597'
119	443,141.9183'	2,190,204.9633'
120	443,129.6854'	2,190,199.2089'
121	443,127.8556'	2,190,188.6008'
122	443,128.0401'	2,190,175.8575'
123	443,137.3757'	2,190,135.9792'
124	443,142.0306'	2,190,123.4007'
125	443,141.8580'	2,190,112.9436'
126	443,139.5473'	2,190,095.8777'
127	443,141.6445'	2,190,079.0209'
128	443,160.8196'	2,190,066.1494'
129	443,174.7585'	2,190,058.3971'
130	443,180.7663'	2,190,048.9378'
131	443,190.6415'	2,190,032.2452'
132	443,211.5168'	2,190,020.0825'
133	443,229.1954'	2,190,007.5956'
134	443,239.3943'	2,189,982.7345'
135	443,243.6363'	2,189,972.0061'
136	443,240.8534'	2,189,959.3228'
137	443,233.5907'	2,189,954.0196'
138	443,218.8256'	2,189,950.2811'
139	443,199.1107'	2,189,936.5929'
140	443,211.2517'	2,189,921.7987'
141	443,232.3972'	2,189,899.5620'
142	443,241.0783'	2,189,889.9139'
143	443,247.9286'	2,189,876.6416'
144	443,259.0703'	2,189,840.6139'
145	443,263.4510'	2,189,830.4570'
146	443,273.1664'	2,189,820.4861'
147	443,284.8532'	2,189,813.1881'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

I, Cindy Cotta, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by _____ REVIEW OFFICER

6-19-14 DATE

FILED FOR REGISTRATION June 23, 2014 at 8:45 A M
PLAT CABINET 86, PAGE 79.

Eleanor Bradshaw by: Amy B Jordan
REGISTER OF DEEDS SAMPSON COUNTY Deputy

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____ ADMINISTRATOR

6-19-14 DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

CONSERVATION EASEMENT
SURVEY OF

THE NUCKOLLS, ET ALS. PROPERTY
FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AI
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 80'

80' 40' 0 80' 160'
GRAPHIC SCALE

SHEET 4 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 80'	DRAWING NAME: S-4

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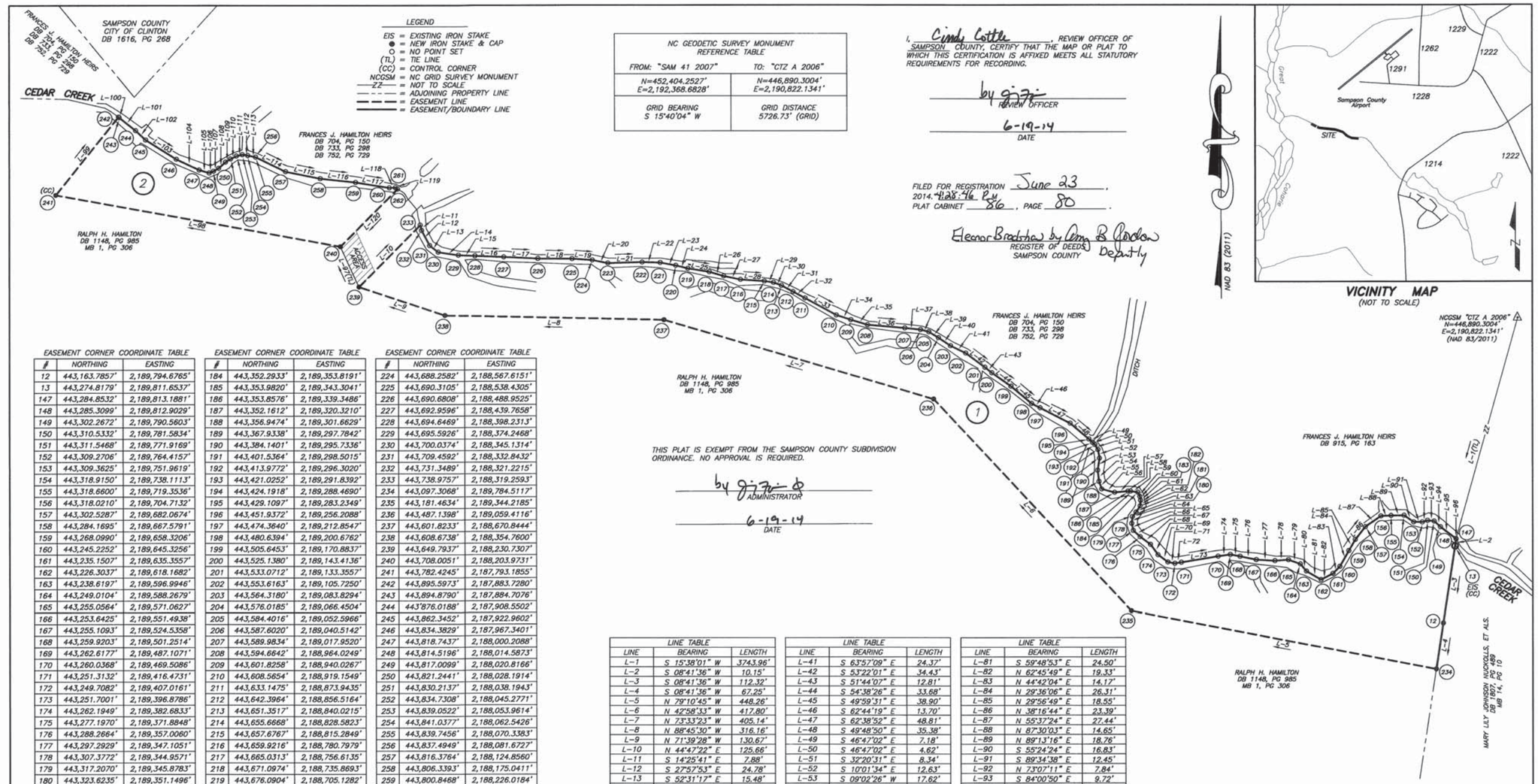


NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature]
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014. 4:28:46 PM
PLAT CABINET B6, PAGE 80.

Eleanor Bradshaw by Gena B Gordon
REGISTER OF DEEDS
SAMPSON COUNTY
Deputy

VICINITY MAP
(NOT TO SCALE)

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by [signature]
ADMINISTRATOR

6-19-14
DATE

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
12	443,163.7857'	2,189,794.6765'
13	443,274.8179'	2,189,811.6537'
147	443,284.8532'	2,189,813.1881'
148	443,285.3099'	2,189,812.9029'
149	443,302.2672'	2,189,790.5603'
150	443,310.5332'	2,189,781.5834'
151	443,311.5468'	2,189,771.9169'
152	443,309.2706'	2,189,764.4157'
153	443,309.3625'	2,189,751.9619'
154	443,318.9150'	2,189,738.1113'
155	443,318.6600'	2,189,719.3536'
156	443,318.0210'	2,189,704.7132'
157	443,302.5287'	2,189,682.0674'
158	443,284.1695'	2,189,667.5791'
159	443,268.0990'	2,189,658.3206'
160	443,245.2252'	2,189,645.3256'
161	443,235.1507'	2,189,635.3557'
162	443,226.3037'	2,189,618.1682'
163	443,238.6197'	2,189,596.9946'
164	443,249.0104'	2,189,588.2679'
165	443,255.0564'	2,189,571.0627'
166	443,253.6425'	2,189,551.4938'
167	443,255.1093'	2,189,524.5358'
168	443,259.9203'	2,189,501.2514'
169	443,262.6177'	2,189,487.1071'
170	443,260.0368'	2,189,469.5086'
171	443,251.3132'	2,189,416.4731'
172	443,249.7082'	2,189,407.0161'
173	443,251.7001'	2,189,396.8786'
174	443,262.1949'	2,189,382.6833'
175	443,277.1970'	2,189,371.8848'
176	443,288.2664'	2,189,357.0060'
177	443,297.2929'	2,189,347.1051'
178	443,307.3772'	2,189,344.9571'
179	443,317.2070'	2,189,345.8783'
180	443,323.6235'	2,189,351.1496'
181	443,332.6565'	2,189,357.0786'
182	443,340.6142'	2,189,357.6966'
183	443,346.0415'	2,189,356.6628'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
184	443,352.2933'	2,189,353.8191'
185	443,353.9820'	2,189,343.3041'
186	443,353.8576'	2,189,339.3486'
187	443,352.1612'	2,189,320.3210'
188	443,356.9474'	2,189,301.6629'
189	443,367.9338'	2,189,297.7842'
190	443,384.1401'	2,189,295.7336'
191	443,401.5364'	2,189,298.5015'
192	443,413.9772'	2,189,296.3020'
193	443,421.0252'	2,189,291.8392'
194	443,424.1918'	2,189,288.4690'
195	443,429.1097'	2,189,283.2349'
196	443,451.9372'	2,189,256.2088'
197	443,474.3640'	2,189,212.8547'
198	443,480.6394'	2,189,200.6762'
199	443,505.6453'	2,189,170.8837'
200	443,525.1380'	2,189,143.4136'
201	443,533.0712'	2,189,133.3557'
202	443,553.6163'	2,189,105.7250'
203	443,564.3180'	2,189,083.8294'
204	443,576.0185'	2,189,066.4504'
205	443,584.4016'	2,189,052.5966'
206	443,587.6020'	2,189,040.5142'
207	443,589.9834'	2,189,017.9520'
208	443,594.6642'	2,188,964.0249'
209	443,601.8258'	2,188,940.0267'
210	443,608.5654'	2,188,919.1549'
211	443,633.1475'	2,188,873.9435'
212	443,642.3964'	2,188,856.5164'
213	443,651.3517'	2,188,840.0215'
214	443,655.6668'	2,188,828.5823'
215	443,657.6767'	2,188,815.2849'
216	443,659.9216'	2,188,780.7979'
217	443,665.0313'	2,188,756.6135'
218	443,671.0974'	2,188,735.8693'
219	443,676.0904'	2,188,705.1282'
220	443,680.5421'	2,188,687.8057'
221	443,684.6688'	2,188,665.5982'
222	443,685.2192'	2,188,639.6059'
223	443,683.8691'	2,188,590.1250'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
224	443,688.2582'	2,188,567.6151'
225	443,690.3105'	2,188,538.4305'
226	443,690.6808'	2,188,488.9525'
227	443,692.9596'	2,188,439.7658'
228	443,694.6469'	2,188,398.2313'
229	443,695.5926'	2,188,374.2468'
230	443,700.0374'	2,188,345.1314'
231	443,709.4592'	2,188,332.8432'
232	443,731.3489'	2,188,321.2215'
233	443,738.9757'	2,188,319.2593'
234	443,097.3068'	2,189,784.5117'
235	443,181.4634'	2,189,344.2185'
236	443,487.1398'	2,189,059.4116'
237	443,601.8233'	2,188,670.8444'
238	443,608.6738'	2,188,354.7600'
239	443,649.7937'	2,188,230.7307'
240	443,708.0051'	2,188,203.9731'
241	443,782.4245'	2,187,793.1855'
242	443,895.5973'	2,187,883.7280'
243	443,894.8790'	2,187,884.7076'
244	443'876.0188'	2,187,908.5502'
245	443,862.3452'	2,187,922.9602'
246	443,834.3829'	2,187,967.3401'
247	443,818.7437'	2,188,000.2088'
248	443,814.5196'	2,188,014.5873'
249	443,817.0099'	2,188,020.8166'
250	443,821.2441'	2,188,028.1914'
251	443,830.2137'	2,188,038.1943'
252	443,834.7308'	2,188,045.2771'
253	443,839.0522'	2,188,053.9614'
254	443,841.0377'	2,188,062.5426'
255	443,839.7456'	2,188,070.3383'
256	443,837.4949'	2,188,081.6727'
257	443,816.3764'	2,188,124.8560'
258	443,806.3393'	2,188,175.0411'
259	443,800.8468'	2,188,226.0184'
260	443,793.0144'	2,188,274.7469'
261	443,793.2381'	2,188,283.3128'
262	443,791.2417'	2,188,286.5999'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

LINE TABLE

LINE	BEARING	LENGTH
L-1	S 15°38'01" W	374.96'
L-2	S 08°41'36" W	10.15'
L-3	S 08°41'36" W	112.32'
L-4	S 08°41'36" W	67.25'
L-5	N 79°10'45" W	448.26'
L-6	N 42°58'33" W	417.80'
L-7	N 73°33'23" W	405.14'
L-8	N 88°45'30" W	316.16'
L-9	N 71°39'28" W	130.67'
L-10	N 44°47'22" E	125.66'
L-11	S 14°25'41" E	7.88'
L-12	S 27°57'53" E	24.78'
L-13	S 52°31'17" E	15.48'
L-14	S 81°19'13" E	29.45'
L-15	S 87°41'31" E	24.00'
L-16	S 87°40'25" E	41.57'
L-17	S 87°20'51" E	49.24'
L-18	S 89°34'16" E	49.48'
L-19	S 85°58'39" E	29.26'
L-20	S 78°58'00" E	22.93'
L-21	N 88°26'13" E	49.50'
L-22	S 88°47'13" E	26.00'
L-23	S 79°28'23" E	22.59'
L-24	S 75°35'15" E	17.89'
L-25	S 80°46'28" E	31.14'
L-26	S 73°41'59" E	21.61'
L-27	S 78°04'12" E	24.72'
L-28	S 86°16'32" E	34.56'
L-29	S 81°24'17" E	13.45'
L-30	S 69°19'57" E	12.23'
L-31	S 61°30'07" E	18.77'
L-32	S 62°02'39" E	19.73'
L-33	S 61°27'59" E	51.46'
L-34	S 72°06'16" E	21.93'
L-35	S 73°23'01" E	25.04'
L-36	S 85°02'21" E	54.13'
L-37	S 83°58'29" E	22.69'
L-38	S 75°09'51" E	12.50'
L-39	S 58°49'17" E	16.19'
L-40	S 56°02'58" E	20.95'

LINE TABLE

LINE	BEARING	LENGTH
L-41	S 63°57'09" E	24.37'
L-42	S 53°22'01" E	34.43'
L-43	S 51°44'07" E	12.81'
L-44	S 54°38'26" E	33.68'
L-45	S 49°59'31" E	38.90'
L-46	S 62°44'19" E	13.70'
L-47	S 62°38'52" E	48.81'
L-48	S 49°48'50" E	35.38'
L-49	S 46°47'02" E	7.18'
L-50	S 46°47'02" E	4.62'
L-51	S 32°20'31" E	8.34'
L-52	S 10°01'34" E	12.63'
L-53	S 09°02'26" W	17.62'
L-54	S 07°12'41" E	16.34'
L-55	S 19°26'43" E	11.65'
L-56	S 75°36'45" E	19.26'
L-57	N 84°54'19" E	19.10'
L-58	N 88°11'55" E	3.96'
L-59	S 80°52'35" E	10.65'
L-60	S 24°27'32" E	6.87'
L-61	S 10°47'05" E	5.52'
L-62	S 04°26'27" W	7.98'
L-63	S 33°16'47" W	10.81'
L-64	S 39°24'14" W	8.30'
L-65	S 05°21'14" W	9.87'
L-66	S 12°01'28" E	10.31'
L-67	S 47°38'42" E	13.40'
L-68	S 53°21'07" E	18.54'
L-69	S 35°44'47" E	18.48'
L-70	S 53°31'26" E	17.65'
L-71	S 78°53'01" E	10.33'
L-72	N 80°22'04" E	9.59'
L-73	N 80°39'33" E	53.75'
L-74	N 81°39'24" E	17.79'
L-75	S 79°12'11" E	14.40'
L-76	S 78°19'33" E	23.78'
L-77	S 86°53'08" E	27.00'
L-78	N 85°52'03" E	19.62'
L-79	S 70°38'18" E	18.24'
L-80	S 40°01'32" E	13.57'

LINE TABLE

LINE	BEARING	LENGTH
L-81	S 59°48'53" E	24.50'
L-82	N 62°45'49" E	19.33'
L-83	N 44°42'04" E	14.17'
L-84	N 29°36'06" E	26.31'
L-85	N 29°56'49" E	18.55'
L-86	N 38°16'44" E	23.39'
L-87	N 55°37'24" E	27.44'
L-88	N 87°30'03" E	14.65'
L-89	N 89°13'16" E	18.76'
L-90	S 55°24'24" E	16.83'
L-91	S 89°34'38" E	12.45'
L-92	N 73°07'11" E	7.84'
L-93	S 84°00'50" E	9.72'
L-94	S 47°21'39" E	12.20'
L-95	S 52°48'10" E	28.05'
L-96	S 31°59'00" E	0.54'
L-97	N 24°41'11" W	64.07'
L-98	N 79°43'53" W	417.47'
L-99	N 38°39'40" E	144.93'
L-100	S 53°44'53" E	1.21'
L-101	S 51°39'18" E	30.40'
L-102	S 46°30'07" E	19.86'
L-103	S 57°47'11" E	52.45'
L-104	S 64°33'16" E	36.40'
L-105	S 73°37'42" E	14.99'
L-106	N 68°12'35" E	6.71'
L-107	N 60°08'17" E	8.50'
L-108	N 48°07'03" E	13.44'
L-109	N 57°28'19" E	8.40'
L-110	N 63°32'40" E	9.70'
L-111	N 76°58'20" E	8.81'
L-112	S 80°35'21" E	7.90'
L-113	S 78°46'07" E	11.56'
L-114	S 63°56'22" E	48.07'
L-115	S 78°41'24" E	51.18'
L-116	S 83°51'02" E	51.27'
L-117	S 80°52'07" E	49.35'
L-118	N 88°30'15" E	8.57'
L-119	S 58°43'39" E	3.85'
L-120	S 44°47'22" W	117.28'

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

[signature]
L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

[signature]
L-4189

CONSERVATION EASEMENT
SURVEY OF

THE RALPH H. HAMILTON PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-S
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 100'

100' 50' 0 100' 200'
GRAPHIC SCALE

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky Kern Agent 6/23/14
OWNER DATE

SOURCE OF TITLE
DB 1148, PG 985
MB 1, PG 306

ACREAGE DATA (BY COMPUTER)
AREA 1 = 3.937 AC±
AREA 2 = 0.928 AC±
TOTAL = 4.865 AC±

SHEET 5 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 100'	DRAWING NAME: S-5

Book 86 Page 80

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
14	441241.3657	2,191,511.6917'
15	441,254.2978'	2,191,491.2772'
16	441,264.0865'	2,191,474.5276'
17	441,284.2498'	2,191,458.9275'
18	441,302.8204'	2,191,432.7474'
19	441,323.8190'	2,191,382.2901'
20	441,331.5639'	2,191,360.8759'
21	441,341.0934'	2,191,341.8322'
22	441,357.9650'	2,191,320.4639'
23	441,375.5205'	2,191,303.0851'
24	441,391.5837'	2,191,284.6826'
25	441,406.5263'	2,191,264.7626'
26	441,416.1411'	2,191,243.3651'
27	441,437.3792'	2,191,228.0501'
28	441,464.9875'	2,191,192.2870'
29	441,471.2953'	2,191,180.3938'
30	441,483.6851'	2,191,176.3808'
31	441,492.8429'	2,191,173.8598'
32	441506.0875'	2,191,171.8822'
33	441,549.1150'	2,191,148.4275'
34	441,591.6734'	2,191,123.8105'
35	441,620.2310'	2,191,107.6006'
36	441,629.6881'	2,191,097.4936'
37	441,674.1027'	2,191,076.6282'
38	441,715.8622'	2,191,045.9579'
39	441,735.7463'	2,191,037.5878'
40	441,755.9109'	2,191,029.1724'
41	441,792.7612'	2,191,010.6729'
42	441,816.6093'	2,191,000.4679'
43	441,842.4176'	2,190,999.2925'
44	441,860.5944'	2,190,993.0629'
45	441,887.5104'	2,190,976.6554'
46	441,927.2170'	2,190,958.9016'
47	441,971.5596'	2,190,949.7975'
48	442,017.9192'	2,190,930.4895'
49	442,047.4126'	2,190,925.8520'
50	442,070.9428	2,190,921.0667'
51	442,112.1131'	2,190,898.0209'
52	442,137.3281'	2,190,890.8540'
53	442,159.7357'	2,190,880.1971'
54	442,191.4894'	2,190,866.6399'
55	442,203.9669'	2,190,862.5310'
56	442,214.5544'	2,190,862.9982'
57	442,232.0754'	2,190,859.3669'
58	442,249.7705'	2,190,843.6663'
59	442,288.2121'	2,190,814.1765'
60	442,302.9773'	2,190,790.8690'
61	442,306.8561'	2,190,776.6442'
62	442,315.6409'	2,190,767.6016'
63	442,318.6510'	2,190,765.5914'
304	442,348.8211'	2,190,786.2018'
305	442,376.2690'	2,190,810.8574'
306	442,387.6274'	2,190,819.1879'
307	442,224.4192'	2,190,946.3394'
308	441,808.3750'	2,191,092.9574'
309	441,537.7143'	2,191,230.2247'
310	441,380.1274'	2,191,420.3449'
311	441,363.3433'	2,191,483.7032'
312	441,318.9526'	2,191,543.4565'
313	441,244.9606'	2,191,513.1260'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

LINE TABLE

LINE	BEARING	LENGTH
L-1	S 07°22'37" E	5617.85'
L-2	S 22°17'22" W	79.97'
L-3	S 21°45'06" W	3.87'
L-4	N 57°38'48" W	24.17'
L-5	N 59°41'51" W	19.40'
L-6	N 37°43'43" W	25.49'
L-7	N 54°39'01" W	32.10'
L-8	N 67°24'17" W	54.65'
L-9	N 70°06'59" W	22.77'
L-10	N 63°25'00" W	21.29'
L-11	N 51°42'24" W	27.23'
L-12	N 44°42'37" W	24.70'
L-13	N 48°52'58" W	24.43'
L-14	N 53°07'31" W	24.90'
L-15	N 65°48'13" W	23.46'
L-16	N 35°47'45" W	26.18'
L-17	N 52°19'58" W	45.18'
L-18	N 62°03'35" W	13.46'
L-19	N 17°56'49" W	13.02'
L-20	N 15°23'29" W	9.50'
L-21	N 08°29'32" W	13.39'
L-22	N 28°35'43" W	49.00'
L-23	N 30°02'47" W	49.17'
L-24	N 29°34'49" W	32.84'
L-25	N 46°54'09" W	13.84'
L-26	N 25°09'49" W	49.07'
L-27	N 36°17'44" W	51.81'
L-28	N 22°49'42" W	21.57'
L-29	N 22°39'09" W	21.85'
L-30	N 26°39'27" W	41.23'
L-31	N 23°10'01" W	25.94'
L-32	N 02°36'28" W	25.84'
L-33	N 18°55'04" W	19.21'
L-34	N 31°21'57" W	31.52'
L-35	N 24°05'26" W	43.49'
L-36	N 11°36'08" W	45.27'
L-37	N 22°36'39" W	50.22'
L-38	N 08°56'09" W	29.86'
L-39	N 11°29'43" W	24.01'
L-40	N 29°14'19" W	47.18'
L-41	N 15°52'01" W	26.21'
L-42	N 25°26'08" W	24.81'
L-43	N 23°07'12" W	34.53'
L-44	N 18°13'37" W	13.14'
L-45	N 02°31'36" E	10.60'
L-46	N 11°42'32" W	17.89'
L-47	N 41°34'56" W	23.66'
L-48	N 37°29'35" W	48.45'
L-49	N 57°38'45" W	27.59'
L-50	N 74°44'51" W	14.74'
L-51	N 45°49'43" W	12.61'
L-52	N 33°44'07" W	3.62'
L-53	N 34°20'19" E	36.54'
L-54	N 41°55'57" E	36.90'
L-55	N 36°15'26" E	14.09'
L-56	S 37°55'17" E	206.89'
L-57	S 19°24'47" E	441.12'
L-58	S 26°53'32" E	303.48'
L-59	S 50°20'43" E	246.94'
L-60	S 75°09'46" E	65.54'
L-61	S 53°23'29" E	74.44'

FRANCES J. HAMILTON HEIRS
DB 915, PG 163

CEDAR CREEK

RALPH H. HAMILTON
DB 1878, PG 824

MARY LILY JOHNSON NUCKOLLS, ET ALS.
DB 1807, PG 489
MB 14, PG 10

WATER TRANSMISSION LINE EASEMENT
DB 1545, PG 311

BOYKIN BRIDGE RD.
NCSR 1214
60' PUBLIC R/W

NCGSM "CTZ A 2006"
N=446,890.3004'
E=2,190,822.1341'
(NAD 83/2011)

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____ ADMINISTRATOR

6-19-14
DATE

I, Cindy Cattle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

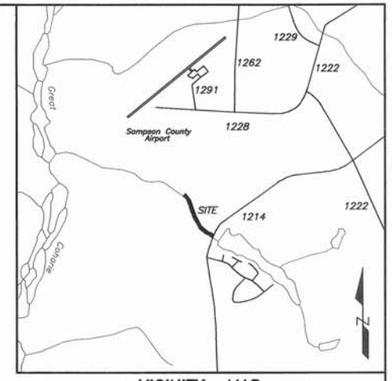
by _____ REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014 4:28:47 PM
PLAT CABINET 86, PAGE 81.

Eleanor Braddon by: Amy B Godwin
REGISTER OF DEEDS
SAMPSON COUNTY
Deputy

NAD 83 (2011)



VICINITY MAP
(NOT TO SCALE)

LEGEND

R/W = RIGHT-OF-WAY
C/L = CENTERLINE
● = NEW IRON STAKE & CAP
○ = NO POINT SET
(TL) = TIE LINE
(CC) = CONTROL CORNER
NCGSM = NC GRID SURVEY MONUMENT
ZZ = NOT TO SCALE
= ADJOINING PROPERTY LINE
= EASEMENT LINE
= EASEMENT/BOUNDARY LINE

NOTES:

1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE

FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

CONSERVATION EASEMENT
SURVEY OF

THE RALPH H. HAMILTON PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-S
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 100'

100' 50' 0 100' 200'
GRAPHIC SCALE

SOURCE OF TITLE
DB 1878, PG 824

ACREAGE DATA (BY COMPUTER)
2.401 AC±

SHEET 6 OF 14

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky Kerr, Agent 6/23/14
OWNER DATE

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 100'	DRAWING NAME: S-6

Book 81a Page 81

I, Cindy Gittle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature]
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014, 4:28:48 PM
PLAT CABINET 86, PAGE 82.

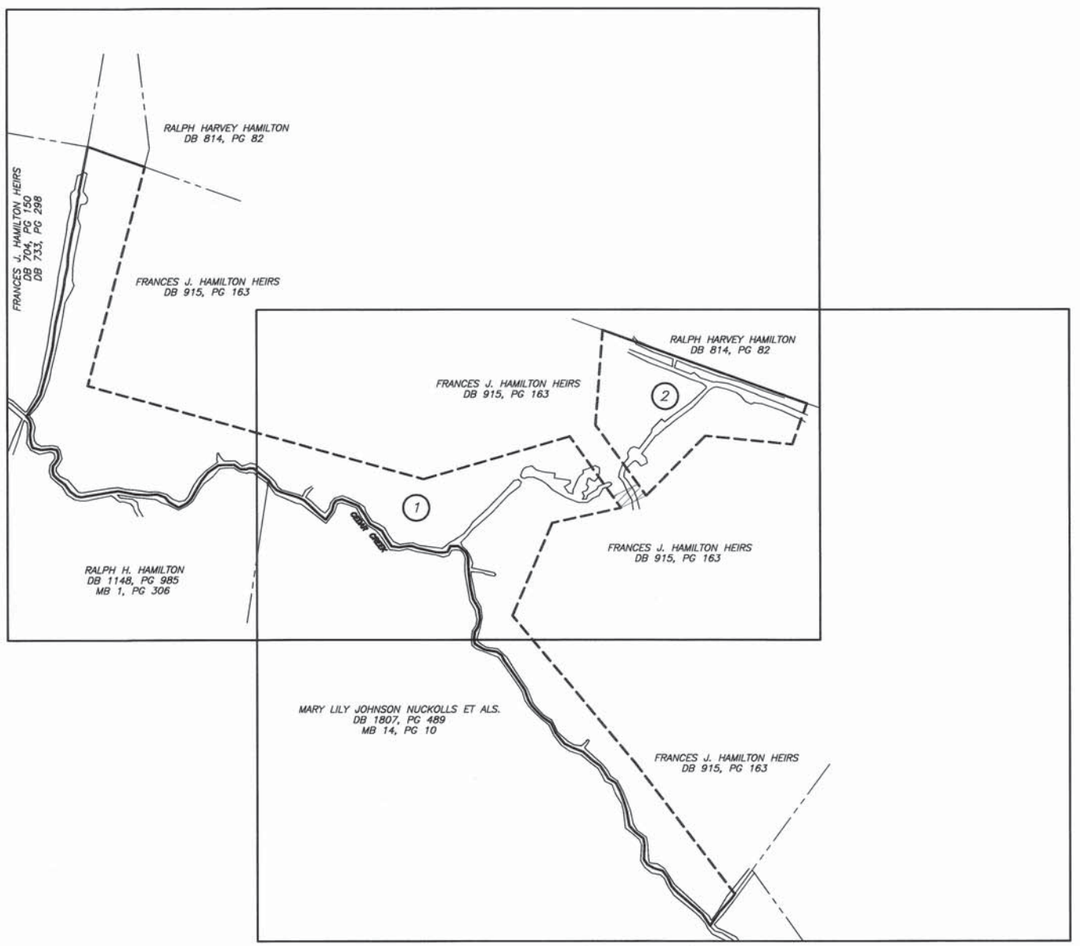
Eleanor Bradshaw by: Ann B. Jordan
REGISTER OF DEEDS
SAMPSON COUNTY
Deputy

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

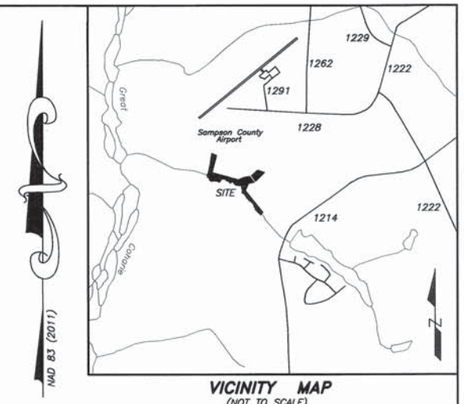
by [signature]
ADMINISTRATOR

6-19-14
DATE

SHEET 9 OF 14



SHEET 8 OF 14



VICINITY MAP
(NOT TO SCALE)

LEGEND

EIS	= EXISTING IRON STAKE
●	= NEW IRON STAKE & CAP
○	= NO POINT SET
(TL)	= TIE LINE
(CC)	= CONTROL CORNER
NCGSM	= NC GRID SURVEY MONUMENT
ZZ	= NOT TO SCALE
	= ADJOINING PROPERTY LINE
	= EASEMENT LINE
	= EASEMENT/BOUNDARY LINE

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky S. Ken, Agent 6/23/14
OWNER DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

[signature]
L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

[signature]
L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

CONSERVATION EASEMENT
SURVEY OF

THE FRANCES J. HAMILTON HEIRS PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 200'

200' 100' 0 200' 400'
GRAPHIC SCALE

SOURCE OF TITLE
DB 915, PG 163

ACREAGE DATA (BY COMPUTER)
AREA 1 = 7.805 AC±
AREA 2 = 1.907 AC±
TOTAL = 9.712 AC±

SHEET 7 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 200'	DRAWING NAME: S-7

Book 86 Page 82

I, Cindy Gotte, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by gjf
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014 4:28:49 PM
PLAT CABINET 86, PAGE 83

Eleanor Bradsher by: Amy B Gordon Deputy
REGISTER OF DEEDS
SAMPSON COUNTY

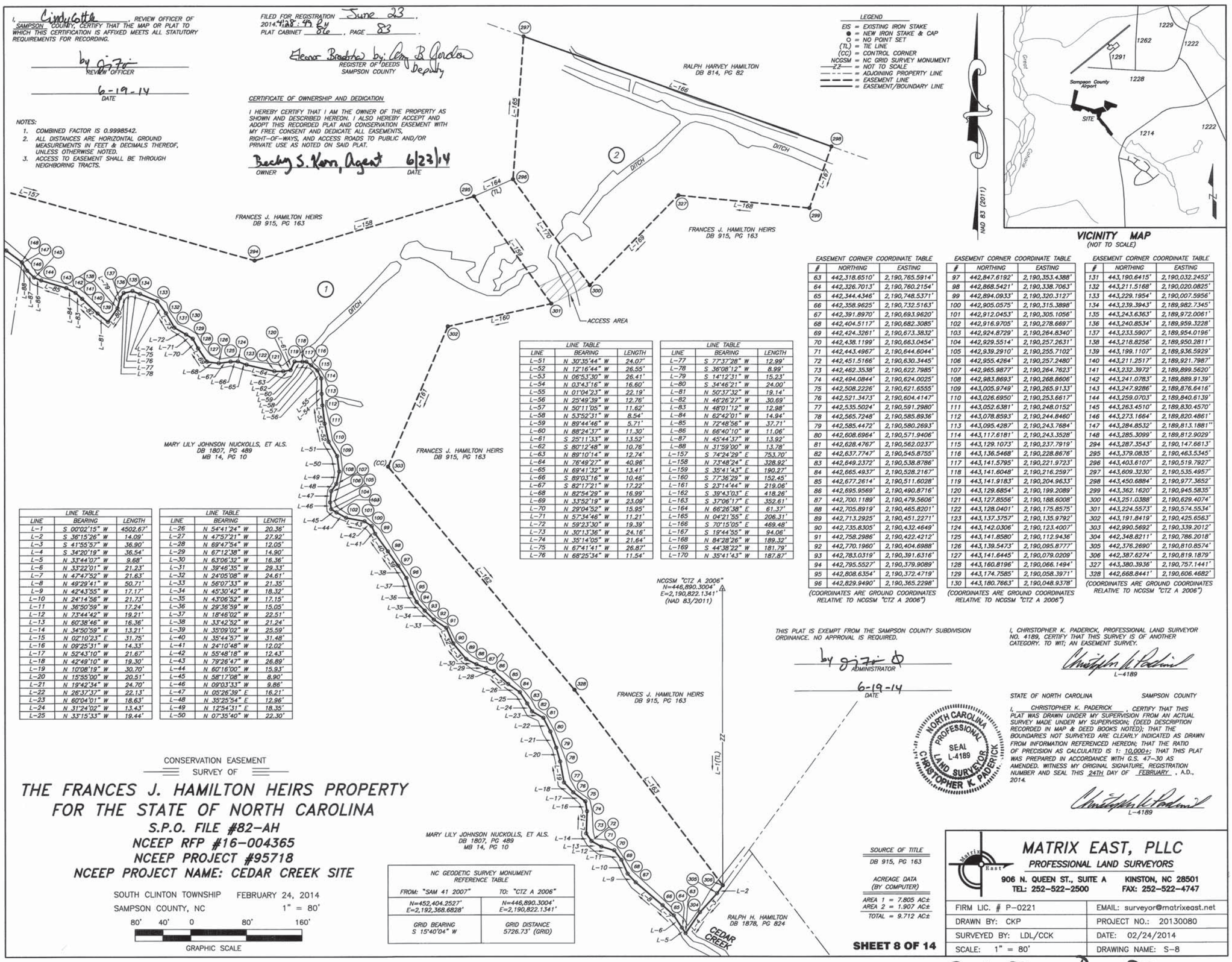
CERTIFICATE OF OWNERSHIP AND DEDICATION

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

Becky S. Kern, Agent 6/23/14
OWNER DATE

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

LEGEND
EIS = EXISTING IRON STAKE
● = NEW IRON STAKE & CAP
○ = NO POINT SET
(TL) = TIE LINE
(CC) = CONTROL CORNER
NCGSM = NC GRID SURVEY MONUMENT
ZZ = NOT TO SCALE
= ADJOINING PROPERTY LINE
= EASEMENT LINE
= EASEMENT/BOUNDARY LINE



VICINITY MAP
(NOT TO SCALE)

LINE TABLE		
LINE	BEARING	LENGTH
L-1	S 00°02'15" W	4502.67'
L-2	S 36°15'26" W	14.09'
L-3	S 41°55'57" W	36.90'
L-4	S 34°20'19" W	36.54'
L-5	N 33°44'07" W	9.68'
L-6	N 33°22'01" W	21.23'
L-7	N 47°47'52" W	21.63'
L-8	N 49°29'41" W	50.71'
L-9	N 42°43'55" W	17.17'
L-10	N 24°14'56" W	21.73'
L-11	N 36°50'59" W	17.24'
L-12	N 73°44'42" W	19.21'
L-13	N 60°38'46" W	16.36'
L-14	N 34°50'59" W	13.21'
L-15	N 02°10'23" E	31.75'
L-16	N 09°25'31" W	14.33'
L-17	N 52°43'10" W	21.67'
L-18	N 42°49'10" W	19.30'
L-19	N 10°08'19" W	30.70'
L-20	N 15°55'00" W	20.51'
L-21	N 19°42'34" W	24.70'
L-22	N 26°37'37" W	22.13'
L-23	N 60°04'01" W	18.63'
L-24	N 31°24'02" W	13.43'
L-25	N 33°15'33" W	19.44'

LINE TABLE		
LINE	BEARING	LENGTH
L-26	N 54°41'24" W	20.36'
L-27	N 47°57'21" W	27.92'
L-28	N 69°47'54" W	12.05'
L-29	N 67°12'38" W	14.90'
L-30	N 63°06'32" W	16.36'
L-31	N 39°46'35" W	29.33'
L-32	N 24°05'08" W	24.61'
L-33	N 56°07'33" W	21.35'
L-34	N 45°30'42" W	18.32'
L-35	N 43°06'52" W	17.15'
L-36	N 29°36'59" W	15.05'
L-37	N 18°46'02" W	22.51'
L-38	N 33°42'52" W	21.24'
L-39	N 35°09'02" W	25.59'
L-40	N 35°44'57" W	31.48'
L-41	N 24°10'48" W	12.02'
L-42	N 55°48'18" W	12.43'
L-43	N 79°26'47" W	26.89'
L-44	N 60°16'00" W	15.93'
L-45	N 58°17'08" W	8.90'
L-46	N 09°03'33" W	9.86'
L-47	N 05°26'39" E	16.21'
L-48	N 35°25'54" E	12.96'
L-49	N 12°54'31" E	18.35'
L-50	N 07°35'40" W	22.30'

LINE TABLE		
LINE	BEARING	LENGTH
L-51	N 30°35'44" W	24.07'
L-52	N 12°16'44" W	26.55'
L-53	N 06°53'30" W	26.41'
L-54	N 03°43'16" W	16.60'
L-55	N 01°04'23" W	22.19'
L-56	N 25°49'39" W	12.76'
L-57	N 50°11'05" W	11.62'
L-58	N 53°52'31" W	8.54'
L-59	N 89°44'46" W	5.71'
L-60	N 88°24'37" W	11.30'
L-61	S 25°11'33" W	13.52'
L-62	S 80°12'48" W	10.76'
L-63	N 89°10'14" W	12.74'
L-64	N 76°49'27" W	40.96'
L-65	N 69°41'32" W	13.41'
L-66	S 89°03'16" W	10.46'
L-67	S 82°17'21" W	17.22'
L-68	N 82°54'29" W	16.99'
L-69	N 33°52'19" W	23.09'
L-70	N 29°04'52" W	15.95'
L-71	N 57°34'46" W	11.21'
L-72	N 59°23'30" W	19.39'
L-73	N 30°13'36" W	24.16'
L-74	N 35°14'05" W	21.64'
L-75	N 67°41'41" W	26.87'
L-76	N 68°25'34" W	11.54'

LINE TABLE		
LINE	BEARING	LENGTH
L-77	S 77°37'28" W	12.99'
L-78	S 36°08'12" W	8.99'
L-79	S 14°12'31" W	15.23'
L-80	S 34°46'21" W	24.00'
L-81	N 50°37'32" W	19.14'
L-82	N 46°26'27" W	30.69'
L-83	N 48°01'12" W	12.98'
L-84	N 62°42'01" W	14.94'
L-85	N 72°48'56" W	37.71'
L-86	N 66°40'10" W	11.06'
L-87	N 45°44'37" W	13.92'
L-88	N 31°59'00" W	13.78'
L-157	S 74°24'29" E	253.70'
L-158	N 73°48'24" E	328.92'
L-159	S 35°41'43" E	190.27'
L-160	S 77°36'29" W	152.45'
L-161	S 23°14'44" W	219.06'
L-162	S 39°43'03" E	418.26'
L-163	S 37°06'17" E	352.61'
L-164	N 66°26'38" E	61.37'
L-165	N 04°21'55" E	206.31'
L-166	S 70°15'05" E	469.48'
L-167	S 19°44'55" W	94.06'
L-168	N 84°28'26" W	189.32'
L-169	S 44°38'22" W	181.79'
L-170	N 35°41'43" W	187.87'

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
63	442,318.6510'	2,190,765.5914'
64	442,326.7013'	2,190,760.2154'
65	442,344.4346'	2,190,748.5371'
66	442,358.9625'	2,190,732.5163'
67	442,391.8970'	2,190,693.9620'
68	442,404.5117'	2,190,682.3085'
69	442,424.3261'	2,190,673.3832'
70	442,438.1199'	2,190,663.0454'
71	442,443.4967'	2,190,644.6044'
72	442,451.5166'	2,190,630.3445'
73	442,462.3538'	2,190,622.7985'
74	442,494.0844'	2,190,624.0025'
75	442,508.2226'	2,190,621.6555'
76	442,521.3473'	2,190,604.4147'
77	442,535.5024'	2,190,591.2980'
78	442,565.7248'	2,190,585.8936'
79	442,585.4472'	2,190,580.2693'
80	442,608.6964'	2,190,571.9406'
81	442,628.4767'	2,190,562.0237'
82	442,637.7747'	2,190,545.8755'
83	442,649.2372'	2,190,538.8786'
84	442,665.4937'	2,190,528.2167'
85	442,677.2614'	2,190,511.6028'
86	442,695.9569'	2,190,490.8716'
87	442,700.1189'	2,190,479.5606'
88	442,705.8919'	2,190,465.8201'
89	442,713.2925'	2,190,451.2271'
90	442,735.8305'	2,190,432.4649'
91	442,758.2986'	2,190,422.4212'
92	442,770.1960'	2,190,404.6988'
93	442,783.0319'	2,190,391.6316'
94	442,795.5527'	2,190,379.9089'
95	442,808.6354'	2,190,372.4719'
96	442,829.9490'	2,190,365.2298'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
97	442,847.6192'	2,190,353.4388'
98	442,868.5421'	2,190,338.7063'
99	442,894.0933'	2,190,320.3127'
100	442,905.0575'	2,190,315.3898'
101	442,912.0453'	2,190,305.1056'
102	442,916.9705'	2,190,278.6697'
103	442,924.8729'	2,190,264.8340'
104	442,929.5514'	2,190,257.2631'
105	442,939.2910'	2,190,255.7102'
106	442,955.4264'	2,190,257.2480'
107	442,965.9877'	2,190,264.7623'
108	442,983.8693'	2,190,268.8606'
109	443,005.9749'	2,190,265.9133'
110	443,026.6950'	2,190,253.6617'
111	443,052.6381'	2,190,248.0152'
112	443,078.8593'	2,190,244.8460'
113	443,095.4287'	2,190,243.7684'
114	443,117.6181'	2,190,243.3528'
115	443,129.1073'	2,190,237.7919'
116	443,136.5468'	2,190,228.8676'
117	443,141.5795'	2,190,221.9723'
118	443,141.6048'	2,190,216.2597'
119	443,141.9183'	2,190,204.9633'
120	443,129.6854'	2,190,199.2089'
121	443,127.8556'	2,190,188.6008'
122	443,128.0401'	2,190,175.8575'
123	443,137.3757'	2,190,135.9792'
124	443,142.0306'	2,190,123.4007'
125	443,141.8580'	2,190,112.9436'
126	443,139.5473'	2,190,095.8777'
127	443,141.6445'	2,190,079.0209'
128	443,160.8196'	2,190,066.1494'
129	443,174.7585'	2,190,058.3971'
130	443,180.7663'	2,190,048.9378'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
131	443,190.6415'	2,190,032.2452'
132	443,211.5168'	2,190,020.0825'
133	443,229.1954'	2,190,007.5956'
134	443,239.3943'	2,189,982.7345'
135	443,243.6363'	2,189,972.0061'
136	443,240.8534'	2,189,959.3228'
137	443,233.5907'	2,189,954.0196'
138	443,218.8256'	2,189,950.2811'
139	443,199.1107'	2,189,936.5929'
140	443,211.2517'	2,189,921.7987'
141	443,232.3972'	2,189,899.5620'
142	443,241.0783'	2,189,889.9139'
143	443,247.9286'	2,189,876.6416'
144	443,259.0703'	2,189,840.6139'
145	443,263.4510'	2,189,830.4570'
146	443,273.1664'	2,189,820.4861'
147	443,284.8532'	2,189,813.1881''
148	443,285.3099'	2,189,812.9029'
294	443,287.3543'	2,190,147.6613'
295	443,379.0835'	2,190,463.5345'
296	443,403.6107'	2,190,519.7927'
297	443,609.3230'	2,190,535.4957'
298	443,450.6884'	2,190,977.3652'
299	443,362.1620'	2,190,945.5835'
300	443,251.0388'	2,190,629.4074'
301	443,224.5573'	2,190,574.5534'
302	443,191.8419'	2,190,425.6563'
303	442,990.5692'	2,190,339.2012'
304	442,348.8211'	2,190,786.2018'
305	442,376.2690'	2,190,810.8574'
306	442,387.6274'	2,190,819.1879'
327	443,380.3936'	2,190,757.1441'
328	442,668.8441'	2,190,606.4682'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

CONSERVATION EASEMENT
SURVEY OF

THE FRANCES J. HAMILTON HEIRS PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 80'

80' 40' 0 80' 160'
GRAPHIC SCALE

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by gjf
ADMINISTRATOR

6-19-14
DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

SOURCE OF TITLE
DB 915, PG 163

ACREAGE DATA (BY COMPUTER)
AREA 1 = 7.805 AC±
AREA 2 = 1.907 AC±
TOTAL = 9.712 AC±

SHEET 8 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 80'	DRAWING NAME: S-8

Book 86 Page 83

CONSERVATION EASEMENT
SURVEY OF

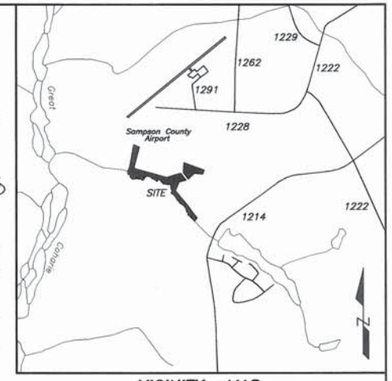
THE FRANCES J. HAMILTON HEIRS PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 80'

80' 40' 0 80' 160'
GRAPHIC SCALE

NAD 83 (2011)



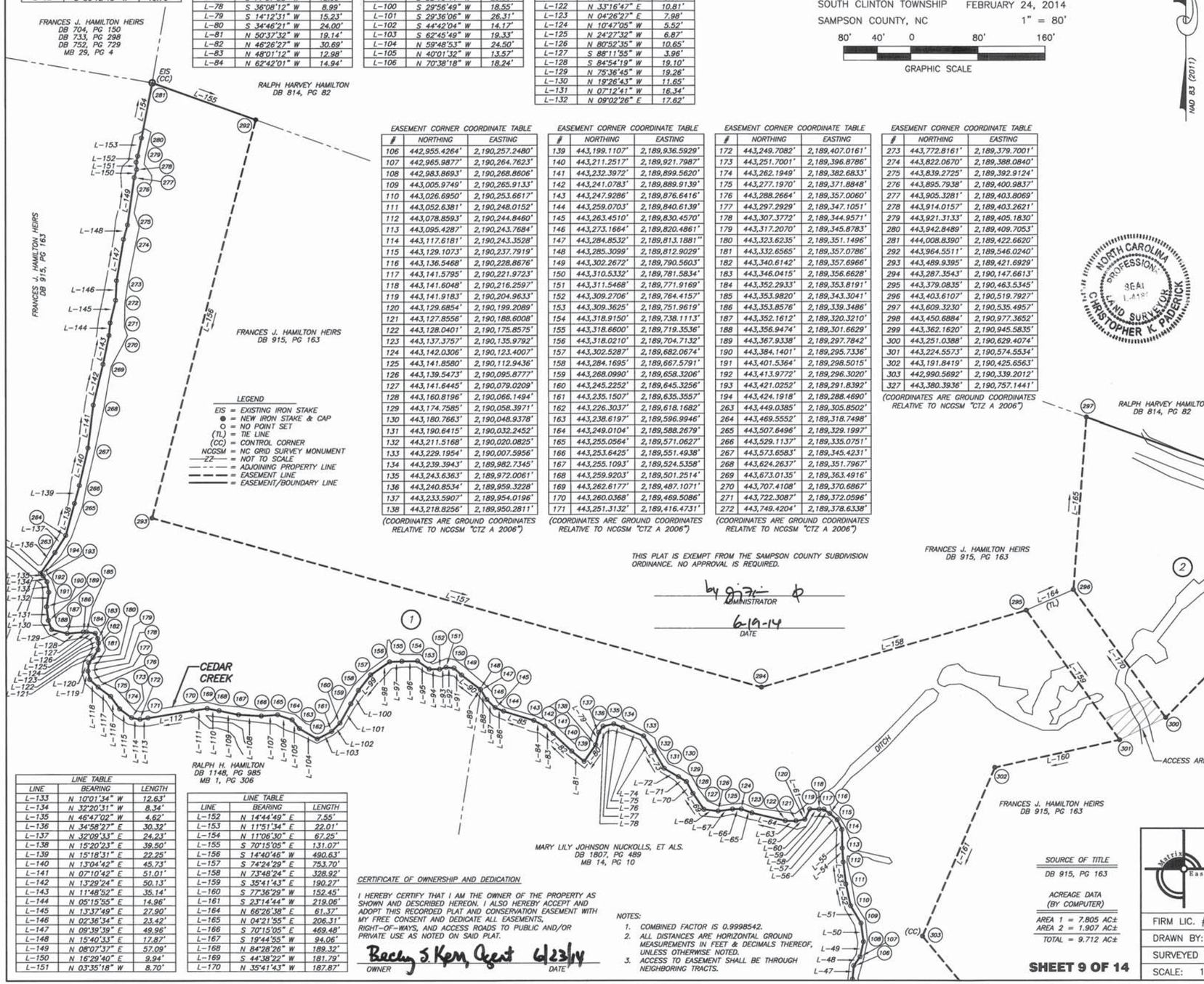
VICINITY MAP
(NOT TO SCALE)

LINE TABLE		
LINE	BEARING	LENGTH
L-48	N 35°25'54" E	12.96'
L-49	N 12°54'31" E	18.35'
L-50	N 07°35'40" W	22.30'
L-51	N 30°35'44" W	24.07'
L-52	N 12°16'44" W	26.55'
L-53	N 06°53'30" W	26.41'
L-54	N 03°43'16" W	16.60'
L-55	N 01°04'23" W	22.19'
L-56	N 25°49'39" W	12.76'
L-57	N 50°11'05" W	11.62'
L-58	N 53°52'31" W	8.54'
L-59	N 89°44'46" W	5.71'
L-60	N 88°24'37" W	11.30'
L-61	S 25°11'33" W	13.52'
L-62	S 80°12'48" W	10.76'

LINE TABLE		
LINE	BEARING	LENGTH
L-63	N 89°10'14" W	12.74'
L-64	N 76°49'27" W	40.96'
L-65	N 69°41'32" W	13.41'
L-66	S 89°03'16" W	10.46'
L-67	S 82°17'21" W	17.22'
L-68	N 82°54'29" W	16.99'
L-69	N 33°52'19" W	23.09'
L-70	N 29°04'52" W	15.95'
L-71	N 57°34'46" W	11.21'
L-72	N 59°23'30" W	19.39'
L-73	N 30°13'36" W	24.16'
L-74	N 35°14'05" W	21.64'
L-75	N 67°41'41" W	26.87'
L-76	N 68°25'34" W	11.54'
L-77	S 77°37'28" W	12.99'
L-78	S 36°08'12" W	8.99'
L-79	S 14°12'31" W	15.23'
L-80	S 34°46'21" W	24.00'
L-81	N 50°37'32" W	19.14'
L-82	N 46°26'27" W	30.69'
L-83	N 48°01'12" W	12.98'
L-84	N 62°42'01" W	14.94'

LINE TABLE		
LINE	BEARING	LENGTH
L-85	N 72°48'56" W	37.71'
L-86	N 66°40'10" W	11.06'
L-87	N 45°44'37" W	13.92'
L-88	N 31°59'00" W	13.78'
L-89	N 31°59'00" W	0.54'
L-90	N 52°48'10" W	28.05'
L-91	N 47°21'39" W	12.20'
L-92	N 84°00'50" W	9.72'
L-93	S 73°07'11" W	7.84'
L-94	N 89°34'38" W	12.45'
L-95	N 55°24'24" W	16.83'
L-96	S 89°13'16" W	18.76'
L-97	S 87°30'03" W	14.65'
L-98	S 55°37'24" W	27.44'
L-99	S 38°16'44" W	23.39'
L-100	S 29°56'49" W	18.55'
L-101	S 29°36'06" W	26.31'
L-102	S 44°42'04" W	14.17'
L-103	S 62°45'49" W	19.33'
L-104	N 59°48'53" W	24.50'
L-105	N 40°01'32" W	13.57'
L-106	N 70°38'18" W	18.24'

LINE TABLE		
LINE	BEARING	LENGTH
L-107	S 85°52'03" W	19.62'
L-108	N 86°53'08" W	27.00'
L-109	N 78°19'33" W	23.78'
L-110	N 79°12'11" W	14.40'
L-111	S 81°39'24" W	17.79'
L-112	S 80°39'33" W	53.75'
L-113	S 80°22'04" W	9.59'
L-114	N 78°53'01" W	10.33'
L-115	N 53°31'26" W	17.65'
L-116	N 35°44'47" W	18.48'
L-117	N 53°21'07" W	18.54'
L-118	N 47°38'42" W	13.40'
L-119	N 12°01'28" W	10.31'
L-120	N 05°21'14" E	9.87'
L-121	N 39°24'14" E	8.30'
L-122	N 33°16'47" E	10.81'
L-123	N 04°26'27" E	7.98'
L-124	N 10°47'05" W	5.52'
L-125	N 24°27'32" W	6.87'
L-126	N 80°52'35" W	10.65'
L-127	S 88°11'55" W	3.96'
L-128	S 84°54'19" W	19.10'
L-129	N 75°36'45" W	19.28'
L-130	N 19°26'43" W	11.65'
L-131	N 07°12'41" W	16.34'
L-132	N 09°02'26" E	17.62'



LEGEND

EIS = EXISTING IRON STAKE
● = NEW IRON STAKE & CAP
○ = NO POINT SET
(TL) = TIE LINE
(CC) = CONTROL CORNER
NCGSM = NC GRID SURVEY MONUMENT
ZZ = NOT TO SCALE
= ADJOINING PROPERTY LINE
= EASEMENT LINE
= EASEMENT/BOUNDARY LINE

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
106	442,955.4264'	2,190,257.2480'
107	442,965.9877'	2,190,264.7623'
108	442,983.8693'	2,190,268.8606'
109	443,005.9749'	2,190,265.9133'
110	443,026.6950'	2,190,253.6617'
111	443,052.6381'	2,190,248.0152'
112	443,078.8593'	2,190,244.8460'
113	443,095.4287'	2,190,243.7684'
114	443,117.6181'	2,190,243.3528'
115	443,129.1073'	2,190,237.7919'
116	443,136.5468'	2,190,228.8676'
117	443,141.5795'	2,190,221.9723'
118	443,141.6048'	2,190,216.2597'
119	443,141.9183'	2,190,204.9633'
120	443,129.6854'	2,190,199.2089'
121	443,127.8556'	2,190,188.6008'
122	443,128.0401'	2,190,175.8575'
123	443,137.3757'	2,190,135.9792'
124	443,142.0306'	2,190,123.4007'
125	443,141.8580'	2,190,112.9436'
126	443,139.5473'	2,190,095.8777'
127	443,141.6445'	2,190,079.0209'
128	443,160.8196'	2,190,066.1494'
129	443,174.7585'	2,190,058.3971'
130	443,180.7663'	2,190,048.9378'
131	443,190.6415'	2,190,032.2452'
132	443,211.5168'	2,190,020.0825'
133	443,229.1954'	2,190,007.5956'
134	443,239.3943'	2,189,982.7345'
135	443,243.6363'	2,189,972.0061'
136	443,240.8534'	2,189,959.3228'
137	443,233.5907'	2,189,954.0196'
138	443,218.8256'	2,189,950.2811'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
139	443,199.1107'	2,189,936.5929'
140	443,211.2517'	2,189,921.7987'
141	443,232.3972'	2,189,899.5620'
142	443,241.0783'	2,189,889.9139'
143	443,247.9286'	2,189,876.6416'
144	443,259.0703'	2,189,840.6139'
145	443,263.4510'	2,189,830.4570'
146	443,273.1664'	2,189,820.4861'
147	443,284.8532'	2,189,813.1881'
148	443,285.3099'	2,189,812.9029'
149	443,302.2672'	2,189,790.5603'
150	443,310.5332'	2,189,781.5834'
151	443,311.5468'	2,189,771.9169'
152	443,309.2706'	2,189,764.4157'
153	443,309.3625'	2,189,751.9619'
154	443,318.9150'	2,189,738.1113'
155	443,318.6600'	2,189,719.3536'
156	443,318.0210'	2,189,704.7132'
157	443,302.5287'	2,189,682.0674'
158	443,284.1695'	2,189,667.5791'
159	443,268.0990'	2,189,658.3206'
160	443,245.2252'	2,189,645.3256'
161	443,235.1507'	2,189,635.3557'
162	443,226.3037'	2,189,618.1682'
163	443,238.6197'	2,189,596.9946'
164	443,249.0104'	2,189,588.2679'
165	443,255.0564'	2,189,571.0627'
166	443,253.6425'	2,189,551.4938'
167	443,255.1093'	2,189,524.5358'
168	443,259.9203'	2,189,501.2514'
169	443,262.6177'	2,189,487.1071'
170	443,260.0368'	2,189,469.5086'
171	443,251.3132'	2,189,416.4731'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
172	443,249.7082'	2,189,407.0161'
173	443,251.7001'	2,189,396.8786'
174	443,262.1949'	2,189,382.6833'
175	443,277.1970'	2,189,371.8848'
176	443,288.2664'	2,189,357.0060'
177	443,297.2929'	2,189,347.1051'
178	443,307.3772'	2,189,344.9571'
179	443,317.2070'	2,189,345.8783'
180	443,323.6235'	2,189,351.1496'
181	443,332.6565'	2,189,357.0786'
182	443,340.6142'	2,189,357.6966'
183	443,346.0415'	2,189,356.6628'
184	443,352.2933'	2,189,353.8191'
185	443,353.9820'	2,189,343.3041'
186	443,353.8576'	2,189,339.3486'
187	443,352.1612'	2,189,320.3210'
188	443,356.9474'	2,189,301.6629'
189	443,367.9338'	2,189,297.7842'
190	443,384.1401'	2,189,295.7336'
191	443,401.5364'	2,189,298.5015'
192	443,413.9772'	2,189,296.3020'
193	443,421.0252'	2,189,291.8392'
194	443,424.1918'	2,189,288.4690'
263	443,449.0385'	2,189,305.8502'
264	443,469.5552'	2,189,318.7498'
265	443,507.6496'	2,189,329.1997'
266	443,529.1137'	2,189,335.0751'
267	443,573.6583'	2,189,345.4231'
268	443,624.2637'	2,189,351.7967'
269	443,673.0135'	2,189,363.4916'
270	443,707.4108'	2,189,370.6867'
271	443,722.3087'	2,189,372.0596'
272	443,749.4204'	2,189,378.6338'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
273	443,772.8161'	2,189,379.7001'
274	443,822.0670'	2,189,388.0840'
275	443,839.2725'	2,189,392.9124'
276	443,895.7938'	2,189,400.9837'
277	443,905.3281'	2,189,403.8069'
278	443,914.0157'	2,189,403.2621'
279	443,921.3133'	2,189,405.1830'
280	443,942.8489'	2,189,409.7053'
281	444,008.8390'	2,189,422.6620'
292	443,964.5511'	2,189,546.0240'
293	443,489.9395'	2,189,421.6929'
294	443,287.3543'	2,190,147.6613'
295	443,379.0835'	2,190,463.5345'
296	443,403.6107'	2,190,519.7927'
297	443,609.3230'	2,190,535.4957'
298	443,450.6884'	2,190,977.3652'
299	443,362.1620'	2,190,945.5835'
300	443,251.0388'	2,190,629.4074'
301	443,224.5573'	2,190,574.5534'
302	443,191.8419'	2,190,425.6563'
303	442,990.5692'	2,190,339.2012'
327	443,380.3936'	2,190,757.1441'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____ ADMINISTRATOR

6-19-14 DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

FILED FOR REGISTRATION June 23, 2014 at 08:30 A M
PLAT CABINET 86, PAGE 84.

Eleanor Bradshaw by: _____ Deputy
REGISTER OF DEEDS
SAMPSON COUNTY

I, Cindy Cattle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by _____ REVIEW OFFICER

6-19-14 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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Bailey S. Kerr, Agent 6/23/14
OWNER DATE

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

SOURCE OF TITLE
DB 915, PG 163

ACREAGE DATA (BY COMPUTER)
AREA 1 = 7.805 AC±
AREA 2 = 1.907 AC±
TOTAL = 9.712 AC±

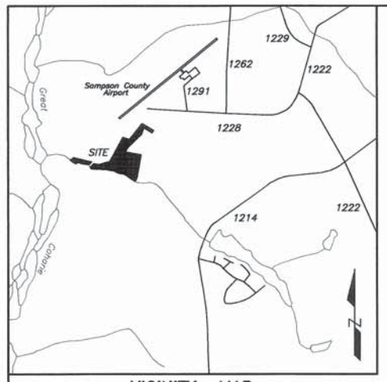
SHEET 9 OF 14

LINE TABLE		
LINE	BEARING	LENGTH
L-133	N 10°01'34" W	12.63'
L-134	N 32°20'31" W	8.34'
L-135	N 46°47'02" W	4.62'
L-136	N 34°58'27" E	30.32'
L-137	N 32°09'33" E	24.23'
L-138	N 15°20'23" E	39.50'
L-139	N 15°18'31" E	22.25'
L-140	N 13°04'42" E	45.73'
L-141	N 07°10'42" E	51.01'
L-142	N 13°29'24" E	50.13'
L-143	N 11°48'52" E	35.14'
L-144	N 05°15'55" E	14.96'
L-145	N 13°37'49" E	27.90'
L-146	N 02°36'34" E	23.42'
L-147	N 09°39'39" E	49.96'
L-148	N 15°40'33" E	17.87'
L-149	N 08°07'37" E	57.09'
L-150	N 16°29'40" E	9.94'
L-151	N 03°35'18" W	8.70'

LINE TABLE		
LINE	BEARING	LENGTH
L-152	N 14°44'49" E	7.55'
L-153	N 11°51'34" E	22.01'
L-154	N 11°06'30" E	67.25'
L-155	S 70°15'05" E	131.07'
L-156	S 14°40'46" W	490.63'
L-157	S 74°24'29" E	753.70'
L-158	N 73°48'24" E	328.92'
L-159	S 35°41'43" E	190.27'
L-160	S 77°36'29" W	152.45'
L-161	S 23°14'44" W	219.06'
L-164	N 66°26'38" E	61.37'
L-165	N 04°21'55" E	206.31'
L-166	S 70°15'05" E	469.48'
L-167	S 19°44'55" W	94.06'
L-168	N 84°28'26" W	189.32'
L-169	S 44°38'22" W	181.79'
L-170	N 35°41'43" W	187.87'

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 80'	DRAWING NAME: S-9



VICINITY MAP
(NOT TO SCALE)

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
194	443,424.1918'	2,189,288.4690'
195	443,429.1097'	2,189,283.2349'
196	443,451.9372'	2,189,256.2088'
197	443,474.3640'	2,189,212.8547'
198	443,480.6394'	2,189,200.6762'
199	443,505.6453'	2,189,170.8837'
200	443,525.1380'	2,189,143.4136'
201	443,533.0712'	2,189,133.3557'
202	443,553.6163'	2,189,105.7250'
203	443,564.3180'	2,189,083.8294'
204	443,576.0185'	2,189,066.4504'
205	443,584.4016'	2,189,052.5968'
206	443,587.6020'	2,189,040.5142'
207	443,589.9834'	2,189,017.9520'
208	443,594.6642'	2,188,964.0249'
209	443,601.8258'	2,188,940.0267'
210	443,608.5654'	2,188,919.1549'
211	443,633.1475'	2,188,873.9435'
212	443,642.3964'	2,188,856.5164'
213	443,651.3517'	2,188,840.0215'
214	443,655.6668'	2,188,828.5823'
215	443,657.6767'	2,188,815.2849'
216	443,659.9216'	2,188,780.7979'
217	443,665.0313'	2,188,756.6135'
218	443,671.0974'	2,188,735.8693'
219	443,676.0904'	2,188,705.1282'
220	443,680.5421'	2,188,687.8057'
221	443,684.6688'	2,188,665.5982'
222	443,685.2192'	2,188,639.6059'
223	443,683.8691'	2,188,590.1250'
224	443,688.2582'	2,188,567.6151'
225	443,690.3105'	2,188,538.4305'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
226	443,690.6808'	2,188,488.9525'
227	443,692.9596'	2,188,439.7658'
228	443,694.6469'	2,188,398.2313'
229	443,695.5926'	2,188,374.2468'
230	443,700.0374'	2,188,345.1314'
231	443,709.4592'	2,188,332.8432'
232	443,731.3489'	2,188,321.2215'
233	443,738.9757'	2,188,319.2593'
242	443,895.5973'	2,187,883.7280'
243	443,894.8790'	2,187,884.7076'
244	443'876.0188'	2,187,908.5502'
245	443,862.3452'	2,187,922.9602'
246	443,834.3829'	2,187,967.3401'
247	443,818.7437'	2,188,000.2088'
248	443,814.5196'	2,188,014.5873'
249	443,817.0099'	2,188,020.8166'
250	443,821.2441'	2,188,028.1914'
251	443,830.2137'	2,188,038.1943'
252	443,834.7308'	2,188,045.2771'
253	443,839.0522'	2,188,053.9614'
254	443,841.0377'	2,188,062.5426'
255	443,839.7456'	2,188,070.3383'
256	443,837.4949'	2,188,081.6727'
257	443,816.3764'	2,188,124.8560'
258	443,806.3393'	2,188,175.0411'
259	443,800.8468'	2,188,226.0184'
260	443,793.0144'	2,188,274.7469'
261	443,793.2381'	2,188,283.3128'
262	443,791.2417'	2,188,286.5999'
263	443,449.0385'	2,189,305.8502'
264	443,469.5552'	2,189,318.7498'
265	443,507.6496'	2,189,329.1997'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
266	443,529.1137'	2,189,335.0751'
267	443,573.6583'	2,189,345.4231'
268	443,624.2637'	2,189,351.7967'
269	443,673.0135'	2,189,363.4916'
270	443,707.4108'	2,189,370.6867'
271	443,722.3087'	2,189,372.0596'
272	443,749.4204'	2,189,378.6338'
273	443,772.8161'	2,189,379.7001'
274	443,822.0670'	2,189,388.0840'
275	443,839.2725'	2,189,392.9124'
276	443,895.7938'	2,189,400.9837'
277	443,905.3281'	2,189,403.8069'
278	443,914.0157'	2,189,403.2621'
279	443,921.3133'	2,189,405.1830'
280	443,942.8489'	2,189,409.7053'
281	444,008.8390'	2,189,422.6620'
282	444,069.8774'	2,189,072.0961'
283	444,191.5822'	2,189,161.2648'
284	444,454.4782'	2,189,432.6355'
285	444,590.4685'	2,189,485.0775'
286	444,461.2096'	2,189,661.1635'
314	443,908.6516'	2,187,894.1719'
315	443,896.0483'	2,187,908.0898'
316	443,949.6716'	2,187,956.6481'
317	443,853.9450'	2,188,348.8438'
318	443,818.0490'	2,188,397.7533'
319	443,798.5918'	2,188,505.9953'
320	443,865.5898'	2,188,747.1288'
321	444,384.7249'	2,189,028.3851'
322	444,344.5606'	2,189,172.1606'
323	444,685.2860'	2,189,445.4314'
324	444,531.2804'	2,189,694.1650'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

I, Cindy Cathey, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature] REVIEW OFFICER

6-19-14 DATE

FILED FOR REGISTRATION 2014 June 23 PLAT CABINET E, PAGE 85

Eleanor Bradshaw by: Amy B. Gordon REGISTER OF DEEDS SAMPSON COUNTY Deputy

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by [signature] ADMINISTRATOR

6-19-14 DATE

SAMPSON COUNTY
CITY OF CLINTON
DB 1616, PG 268

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

RALPH H. HAMILTON
DB 1148, PG 985
MB 1, PG 306

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

NCGSM "CTZ A 2006"
N=446,890.3004'
E=2,190,822.1341'
(NAD 83/2011)

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

JAMES L. HAMILTON, ET ALS.
DB 955, PG 767

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729
MB 29, PG 4

RALPH HARVEY HAMILTON
DB 1220, PG 990
MB 29, PG 4

RALPH HARVEY HAMILTON
DB 814, PG 82

FRANCES J. HAMILTON HEIRS
DB 915, PG 163

RALPH H. HAMILTON
DB 1148, PG 985
MB 1, PG 306

DITCH

CEDAR CREEK

NAD 83 (2011)

LEGEND
- ECM = EXISTING CONCRETE MONUMENT
- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- ○ = NO POINT SET
- (TIL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

SOURCE OF TITLE
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

ACREAGE DATA
(BY COMPUTER)
AREA 1 = 11.180 AC±
AREA 2 = 0.844 AC±
TOTAL = 12.024 AC±

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky S. Kerr, Agent 6/23/14
OWNER DATE

LINE TABLE

LINE	BEARING	LENGTH
L-1	S 35°35'56" W	3081.47
L-2	S 74°23'31" E	149.28
L-3	N 38°43'50" E	436.77
L-4	S 58°14'09" E	292.55
L-5	S 33°23'19" W	59.97'
L-6	N 58°10'52" W	52.46'
L-7	N 58°10'52" W	207.23'
L-8	S 21°05'17" W	145.75
L-9	S 45°54'32" W	377.83
L-10	S 36°13'44" W	150.87
L-11	S 80°07'23" E	355.84
L-12	S 11°06'30" E	67.25
L-13	S 11°51'34" W	22.01
L-14	S 14°44'49" W	7.55
L-15	S 03°35'18" E	8.70
L-16	S 16°29'40" W	9.94
L-17	S 08°07'37" W	57.09
L-18	S 15°40'33" W	17.87
L-19	S 09°39'39" W	49.96
L-20	S 02°36'34" W	23.42
L-21	S 13°37'49" W	27.90
L-22	S 05°15'55" W	14.96
L-23	S 11°48'52" W	35.14
L-24	S 13°29'24" W	50.13
L-25	S 07°10'42" W	51.01
L-26	S 13°04'42" W	45.73
L-27	S 15°18'31" W	22.25
L-28	S 15°20'23" W	39.50
L-29	S 32°09'33" W	24.23
L-30	S 34°58'27" W	30.32
L-31	N 46°47'02" W	7.18
L-32	N 49°48'50" W	35.38
L-33	N 62°38'52" W	48.81

LINE TABLE

LINE	BEARING	LENGTH
L-34	N 62°44'19" W	13.70
L-35	N 48°59'31" W	38.90
L-36	N 54°38'26" W	33.68
L-37	N 51°44'07" W	12.81
L-38	N 53°22'01" W	34.43
L-39	N 63°57'09" W	24.37
L-40	N 51°56'02" W	20.95
L-41	N 58°49'17" W	16.19
L-42	N 75°09'51" W	12.50
L-43	N 83°58'29" W	22.69
L-44	N 85°00'21" W	54.13
L-45	N 72°23'01" W	25.04
L-46	N 72°06'16" W	21.93
L-47	N 61°27'59" W	51.46
L-48	N 62°02'39" W	19.73
L-49	N 61°30'07" W	18.77
L-50	N 69°19'57" W	12.23
L-51	N 81°24'17" W	13.45
L-52	N 86°16'32" W	34.56
L-53	N 78°04'12" W	24.72
L-54	N 73°41'59" W	21.61
L-55	N 80°46'28" W	31.14
L-56	N 75°35'15" W	17.89
L-57	N 79°28'23" W	22.59
L-58	N 88°47'13" W	26.00
L-59	S 86°26'13" W	49.50
L-60	N 78°58'00" W	22.93
L-61	N 85°58'39" W	29.26
L-62	N 89°34'16" W	49.48
L-63	N 87°20'51" W	49.24
L-64	N 87°40'25" W	41.57
L-65	N 87°44'31" W	24.00
L-66	N 81°19'13" W	29.45

LINE TABLE

LINE	BEARING	LENGTH
L-67	N 52°31'17" W	15.48
L-68	N 27°57'53" W	24.78
L-69	N 14°25'41" W	7.88
L-70	N 44°47'22" E	111.42
L-71	S 79°48'34" E	109.98
L-72	N 74°28'20" E	250.27
L-73	N 28°26'32" E	590.43
L-74	N 53°43'27" W	60.67
L-75	S 44°47'22" W	88.35
L-76	N 58°43'39" W	3.85
L-77	S 88°30'15" W	8.57
L-78	N 80°52'07" W	49.35
L-79	N 83°51'02" W	51.27
L-80	N 78°41'24" W	51.18
L-81	N 63°56'22" W	48.07
L-82	N 78°46'07" W	11.56
L-83	N 80°35'21" W	7.90
L-84	S 76°58'20" W	8.81
L-85	S 63°32'40" W	9.70
L-86	S 57°28'19" W	8.40
L-87	S 48°07'03" W	13.44
L-88	S 60°08'17" W	8.50
L-89	S 68°12'35" W	6.71
L-90	N 73°37'42" W	14.99
L-91	N 64°33'16" W	36.40
L-92	N 57°47'11" W	52.45
L-93	N 46°30'07" W	19.86
L-94	N 51°39'18" W	30.40
L-95	N 53°44'53" W	1.21
L-96	N 38°39'40" E	16.72
L-97	S 47°20'16" E	18.78
L-98	N 42°09'44" E	72.34
L-99	S 76°17'01" E	403.71

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

[signature] L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

[signature] L-4189

CONSERVATION EASEMENT
SURVEY OF

THE FRANCES J. HAMILTON HEIRS PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 100'

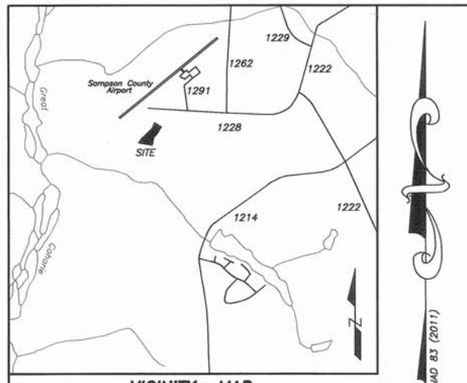
100' 50' 0 100' 200'
GRAPHIC SCALE

SHEET 10 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 100'	DRAWING NAME: S-10

Book 82 Page 82



VICINITY MAP
(NOT TO SCALE)

NAD 83 (2011)

I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature]
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23,
2014, 11:38 AM
PLAT CABINET 86, PAGE 86.

Eleanor Bradshaw by: Ann B Gordon
REGISTER OF DEEDS
SAMPSON COUNTY
Deputy

NCGSM "CTZ A 2006"
N=446,890.3004'
E=2,190,822.1341'
(NAD 83/2011)

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Barclay S. Kerr, Agent 6/23/14
OWNER DATE

LINE TABLE		
LINE	BEARING	LENGTH
L-1	S 30°10'21" W	2660.25
L-2	S 58°10'52" E	207.23
L-3	N 58°10'52" W	52.45
L-4	S 33°23'19" W	249.11'
L-5	S 46°06'30" W	92.35
L-6	S 09°52'14" W	203.36
L-7	N 80°07'23" W	355.84
L-8	N 36°13'44" E	150.87
L-9	N 45°54'32" E	377.83
L-10	N 21°05'17" E	145.75

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
281	444,008.8390'	2,189,422.6620'
282	444,069.8774'	2,189,072.0961'
283	444,191.5822'	2,189,161.2648'
284	444,454.4782'	2,189,432.6355'
285	444,590.4685'	2,189,485.0775'
286	444,481.2096'	2,189,661.1635'
288	444,273.2096'	2,189,524.0714'
289	444,209.1868'	2,189,457.5223'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

FRANCES J. HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

RALPH HARVEY HAMILTON
DB 1220, PG 990
MB 29, PG 4

RALPH HARVEY HAMILTON
DB 814, PG 82

FRANCES J. HAMILTON HEIRS
DB 915, PG 163

LEGEND
- ECM = EXISTING CONCRETE MONUMENT
- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- O = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

[signature]
L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

[signature]
L-4189

CONSERVATION EASEMENT
SURVEY OF

THE FRANCES J. HAMILTON HEIRS PROPERTY
FOR THE STATE OF NORTH CAROLINA
S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 60'

60' 30' 0 60' 120'
GRAPHIC SCALE

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by [signature]
ADMINISTRATOR

6-19-14
DATE

SOURCE OF TITLE
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729
MB 29, PG 4

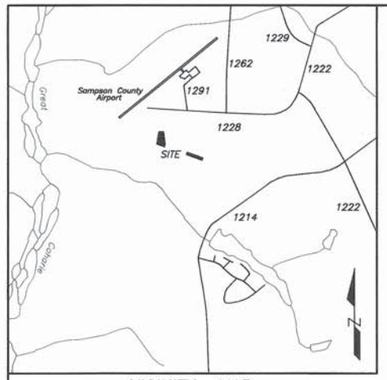
ACREAGE DATA (BY COMPUTER)
3.115 AC±

SHEET 11 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 60'	DRAWING NAME: S-11

Book ___ Page ___



VICINITY MAP
(NOT TO SCALE)

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

LINE TABLE		
LINE	BEARING	LENGTH
L-1	S 26°58'29" W	3008.41
L-2	S 89°49'57" E	74.25
L-3	S 06°50'04" E	206.49
L-4	S 14°40'46" W	40.72
L-5	N 70°15'05" W	131.07
L-6	N 09°52'14" E	203.36
L-7	S 70°15'05" E	1051.30
L-8	N 04°21'55" E	34.23
L-9	S 70°15'05" E	478.56
L-10	S 19°44'55" W	33.00
L-11	N 70°15'05" W	469.48

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
281	444,008.8390'	2,189,422.6620'
287	443,643.4500'	2,190,538.1007'
289	444,209.1868'	2,189,457.5223'
290	444,208.9699'	2,189,531.7706'
291	444,003.9430'	2,189,556.3433'
292	443,964.5511'	2,189,546.0240'
297	443,609.3230'	2,190,535.4957'
298	443,450.6884'	2,190,977.3652'
329	443,481.7475'	2,190,988.5156'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

LEGEND
- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- ○ = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- = ADJOINING PROPERTY LINE
- = EASEMENT LINE
- = EASEMENT/BOUNDARY LINE

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by [signature]
ADMINISTRATOR

6-19-14
DATE

I, Cindy Cattle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature]
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014, 1:08:53 PM
PLAT CABINET B9, PAGE 87

Eleanor Brodgen by: Amy B Jordan
REGISTER OF DEEDS
SAMPSON COUNTY Deputy

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky S. Kem, Agent 6/23/14
OWNER DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

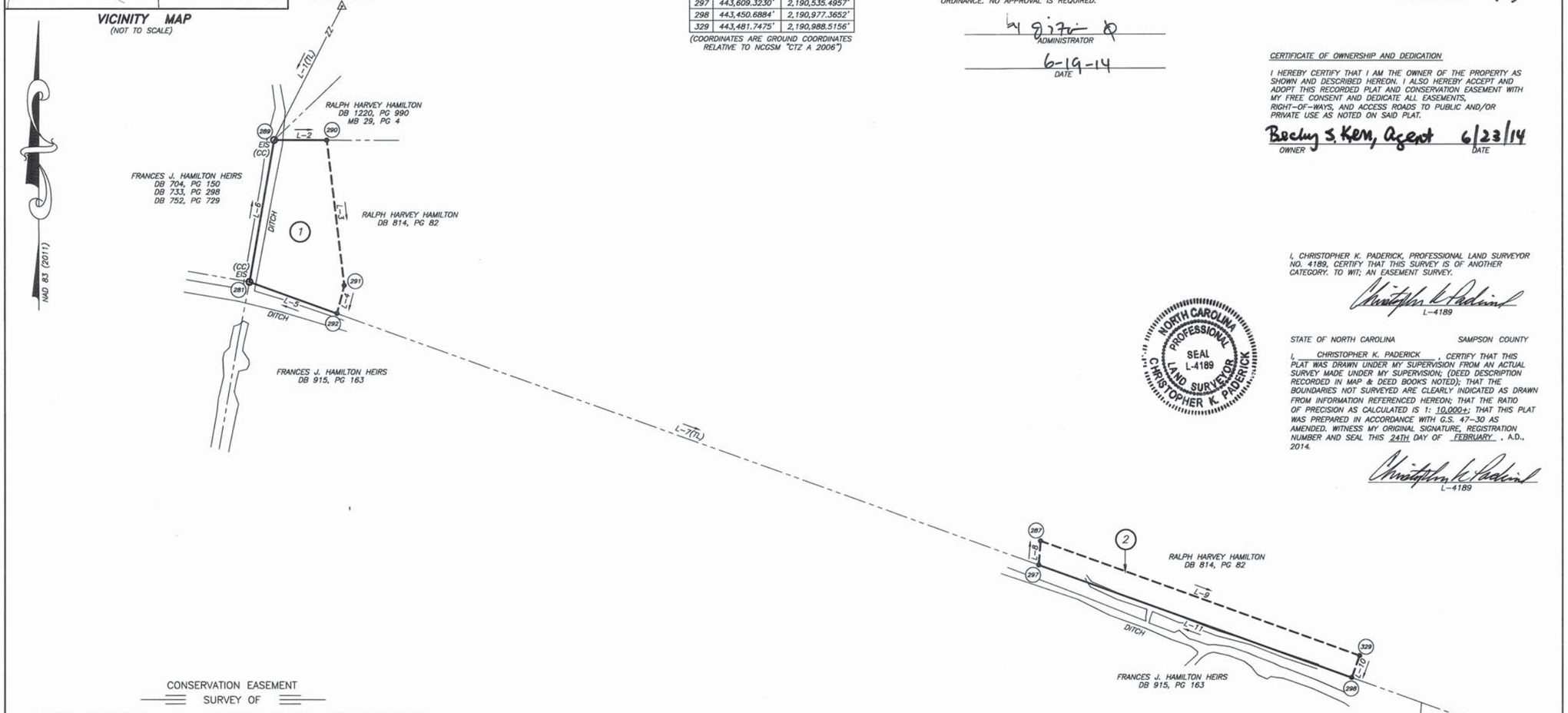
[signature]
L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

[signature]
L-4189



CONSERVATION EASEMENT
SURVEY OF

THE RALPH H. HAMILTON PROPERTY
FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-S
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 100'

100' 50' 0 100' 200'
GRAPHIC SCALE

SOURCE OF TITLE
DB 814, PG 82

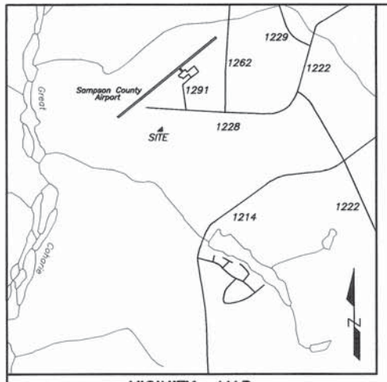
ACREAGE DATA (BY COMPUTER)
AREA 1 = 0.545 AC±
AREA 2 = 0.359 AC±
TOTAL = 0.904 AC±

SHEET 12 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 100'	DRAWING NAME: S-12

Book 84 Page 84



VICINITY MAP
(NOT TO SCALE)

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE	
FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

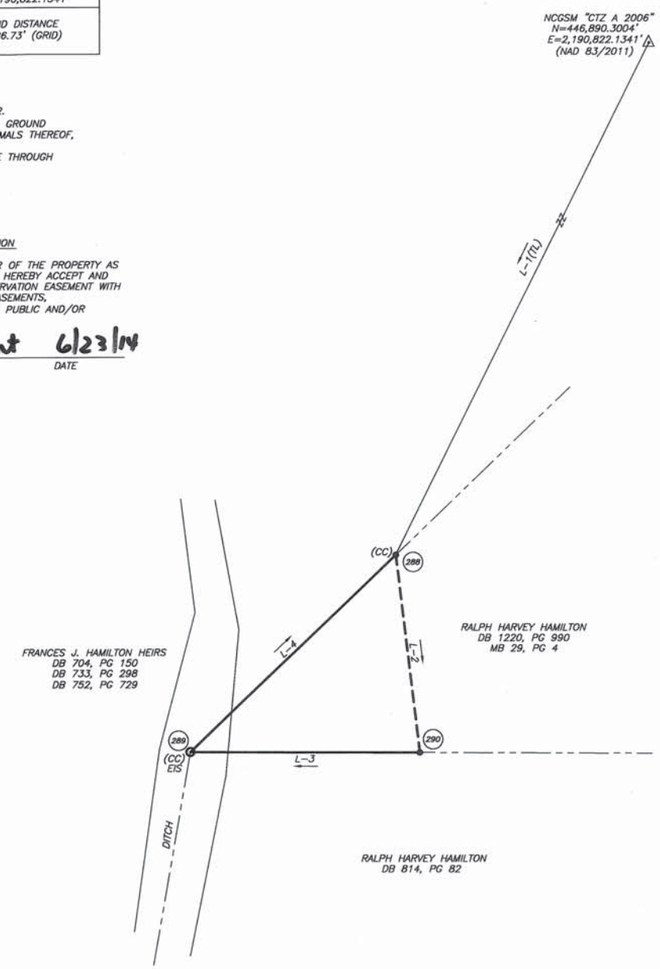
NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Beachy S. Kem, Agent 6/23/14
OWNER DATE

LINE TABLE		
LINE	BEARING	LENGTH
L-1	S 26°22'52" W	2921.32
L-2	S 06°50'04" E	64.70
L-3	N 89°49'57" W	74.25
L-4	N 46°06'30" E	92.35



EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
288	444,273.2096'	2,189,524.0714'
289	444,209.1868'	2,189,457.5223'
290	444,208.9699'	2,189,531.7706'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

NAD 83 (2011)

I, Cindy Gattle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

by [signature]
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23, 2014 4:28 PM
PLAT CABINET 86, PAGE 88.

Eleanor Bradshaw by: [signature] Deputy
REGISTER OF DEEDS
SAMPSON COUNTY

LEGEND
- EIS = EXISTING IRON STAKE
- ● = NEW IRON STAKE & CAP
- ○ = NO POINT SET
- (TL) = TIE LINE
- (CC) = CONTROL CORNER
- NCGSM = NC GRID SURVEY MONUMENT
- ZZ = NOT TO SCALE
- ——— = ADJOINING PROPERTY LINE
- — — — = EASEMENT LINE
- ═══ = EASEMENT/BOUNDARY LINE

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by [signature]
ADMINISTRATOR

6-19-14
DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

[signature]
L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

[signature]
L-4189

CONSERVATION EASEMENT
SURVEY OF

THE RALPH H. HAMILTON PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-S
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 30'

30' 15' 0 30' 60'
GRAPHIC SCALE

SOURCE OF TITLE
DB 1220, PG 990
MB 29, PG 4

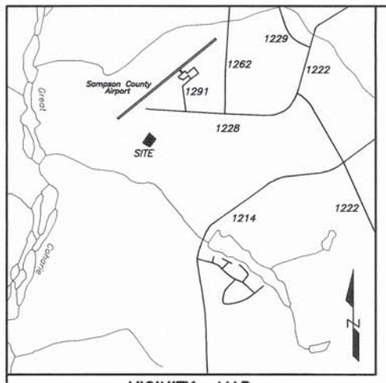
ACREAGE DATA (BY COMPUTER)
0.055 AC±

SHEET 13 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/2014
SCALE: 1" = 30'	DRAWING NAME: S-13

Book 86 Page 88



VICINITY MAP
(NOT TO SCALE)

NAD 83 (2011)

I, Cindy Cottle, REVIEW OFFICER OF SAMPSON COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

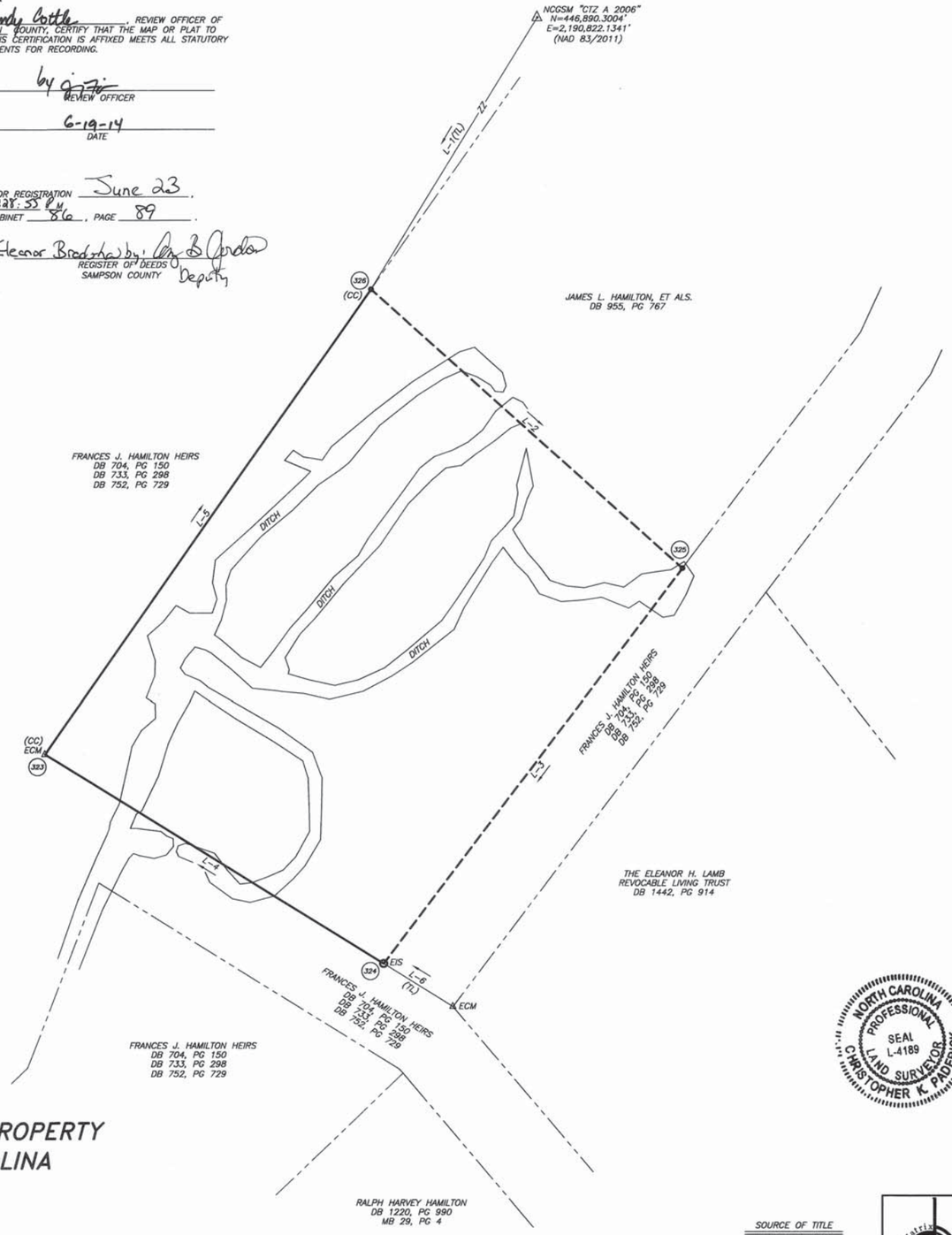
by _____
REVIEW OFFICER

6-19-14
DATE

FILED FOR REGISTRATION June 23,
2014, 4:28:33 PM
PLAT CABINET 86, PAGE 89.

Eleanor Braddy by: Cindy B Gordon
REGISTER OF DEEDS
SAMPSON COUNTY Deputy

NCGSM "CTZ A 2006"
N=446,890.3004'
E=2,190,822.1341'
(NAD 83/2011)



LEGEND

ECM	= EXISTING CONCRETE MONUMENT
EIS	= EXISTING IRON STAKE
●	= NEW IRON STAKE & CAP
O	= NO POINT SET
(TL)	= TIE LINE
(CC)	= CONTROL CORNER
NCGSM	= NC GRID SURVEY MONUMENT
ZZ	= NOT TO SCALE
	= ADJOINING PROPERTY LINE
	= EASEMENT LINE
	= EASEMENT/BOUNDARY LINE

NC GEODETIC SURVEY MONUMENT REFERENCE TABLE

FROM: "SAM 41 2007"	TO: "CTZ A 2006"
N=452,404.2527' E=2,192,368.6828'	N=446,890.3004' E=2,190,822.1341'
GRID BEARING S 15°40'04" W	GRID DISTANCE 5726.73' (GRID)

NOTES:
1. COMBINED FACTOR IS 0.9998542.
2. ALL DISTANCES ARE HORIZONTAL GROUND MEASUREMENTS IN FEET & DECIMALS THEREOF, UNLESS OTHERWISE NOTED.
3. ACCESS TO EASEMENT SHALL BE THROUGH NEIGHBORING TRACTS.

LINE TABLE

LINE	BEARING	LENGTH
L-1	S 31°23'51" W	2,182.66'
L-2	S 48°09'49" E	307.32'
L-3	S 37°04'17" W	364.69'
L-4	N 58°14'09" W	292.55'
L-5	N 35°01'04" E	417.54'
L-6	N 58°14'09" W	60.02'

EASEMENT CORNER COORDINATE TABLE

#	NORTHING	EASTING
323	444,685.2860'	2,189,445.4314'
324	444,531.2804'	2,189,694.1650'
325	444,822.2601'	2,189,913.9985'
326	445,027.2430'	2,189,685.0313'

(COORDINATES ARE GROUND COORDINATES RELATIVE TO NCGSM "CTZ A 2006")

THIS PLAT IS EXEMPT FROM THE SAMPSON COUNTY SUBDIVISION ORDINANCE. NO APPROVAL IS REQUIRED.

by _____
ADMINISTRATOR

6-19-14
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 RECORDED PLAT AND CONSERVATION EASEMENT WITH MY FREE CONSENT AND DEDICATE ALL EASEMENTS, RIGHT-OF-WAYS, AND ACCESS ROADS TO PUBLIC AND/OR PRIVATE USE AS NOTED ON SAID PLAT.

Becky S. Kern, Agent 6/23/14
OWNER DATE

I, CHRISTOPHER K. PADERICK, PROFESSIONAL LAND SURVEYOR NO. 4189, CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY. TO WIT; AN EASEMENT SURVEY.

L-4189

NORTH CAROLINA PROFESSIONAL SEAL L-4189 LAND SURVEYOR CHRISTOPHER K. PADERICK

STATE OF NORTH CAROLINA SAMPSON COUNTY

I, CHRISTOPHER K. PADERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION; (DEED DESCRIPTION RECORDED IN MAP & DEED BOOKS NOTED); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION REFERENCED HEREON; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 10,000+; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24TH DAY OF FEBRUARY, A.D., 2014.

L-4189

CONSERVATION EASEMENT
SURVEY OF

THE JAMES L. HAMILTON, ET ALS. PROPERTY FOR THE STATE OF NORTH CAROLINA

S.P.O. FILE #82-AH
NCEEP RFP #16-004365
NCEEP PROJECT #95718
NCEEP PROJECT NAME: CEDAR CREEK SITE

SOUTH CLINTON TOWNSHIP FEBRUARY 24, 2014
SAMPSON COUNTY, NC 1" = 60'

60' 30' 0 60' 120'
GRAPHIC SCALE

SOURCE OF TITLE
DB 955, PG 767

ACREAGE DATA (BY COMPUTER)
2.682 AC±

SHEET 14 OF 14

MATRIX EAST, PLLC
PROFESSIONAL LAND SURVEYORS
906 N. QUEEN ST., SUITE A KINSTON, NC 28501
TEL: 252-522-2500 FAX: 252-522-4747

FIRM LIC. # P-0221	EMAIL: surveyor@matrixeast.net
DRAWN BY: CKP	PROJECT NO.: 20130080
SURVEYED BY: LDL/CCK	DATE: 02/24/14
SCALE: 1" = 60'	DRAWING NAME: S-14

D.L. & Dana & O

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cedar Creek City/County: Sampson Sampling Date: Jan-29-2013

Applicant/Owner: EEP State: NC Sampling Point: W-19

Investigator(s): G Lankford Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): nearly level Slope (%): <1%

Subregion (LRR or MLRA): LRR P/MLRA 133A Lat: Long: Datum:

Soil Map Unit Name: Bibb and Johnston soils, frequently flooded 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	**Is the Sampled Area within a Wetland?** Yes No ✓
Hydric Soil Present?	Yes No ✓	
Wetland Hydrology Present?	Yes ✓ No	

Remarks:

Site is along UT-1 to Great Coharie Creek. Area is old clear-cut with poor natural regeneration of trees.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ 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)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes	No ✓	Depth (inches):
Water Table Present?	Yes ✓	No	Depth (inches): -15
Saturation Present? (includes capillary fringe)	Yes ✓	No	Depth (inches): - 9

Wetland Hydrology Present? Yes ✓ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology is extensive slope seepage above flood plain.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-19

Tree Stratum (Plot size: 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	20 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 30 foot radius)			
1. Ilex glabra	5	Yes	FACW
2. Magnolia virginiana	4	Yes	FACW
3.			
4.			
5.			
6.			
	9 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 foot radius)			
1. Microstegium vimineum	40	Yes	FAC
2. Eupatorium capillifolium	8	No	FACU
3. Phytolacca americana	3	No	FACU
4. Scirpus cyperinus	2	No	OBL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	53 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 foot radius)			
1. Gelsemium sempervirens	3	Yes	FAC
2.			
3.			
4.			
5.			
	3 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

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:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

Tree is multi-stem stump sprout.

SOIL

Sampling Point: W-19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 2/2	100					SL	
4-10	10 YR 2/2	85	10 YR 2/4	10	C	M	SL	
--	--	--	10 YR 2/6	5	C	PL	--	
10-24	7.5 YR 2.5/1	100					muck	buried beneath levee/spoil berm

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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:

Point is along levee/spoil berm beside abandoned channel.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cedar Creek City/County: Sampson Sampling Date: Jan-29-2013

Applicant/Owner: EEP State: NC Sampling Point: W-20

Investigator(s): G Lankford Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): nearly level Slope (%): <1%

Subregion (LRR or MLRA): LRR P/MLRA 133A Lat: Long: Datum:

Soil Map Unit Name: Bibb and Johnston soils, frequently flooded 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 ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

Site is along UT-1 to Great Coharie Creek.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ 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)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ✓ No ____ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 9

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology is slope seep just above flood plain.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-20

Tree Stratum (Plot size: 20 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	35	Yes	FAC
2. Acer rubrum	30	Yes	FAC
3. Nyssa sylvatica	10	No	FAC
4.			
5.			
6.			
	75	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 20 foot radius)			
1. Ilex opaca	5	Yes	FAC
2. Fagus grandifolia	5	Yes	FACU
3. Persea borbonia	5	Yes	FACW
4.			
5.			
6.			
	15	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 20 foot radius)			
1. Arundinaria gigantea	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 20 foot radius)			
1. Smilax rotundifolia	7	Yes	FAC
2. Vitis rotundifolia	5	Yes	FAC
3. Lonicera japonica	2	No	FAC
4.			
5.			
	14	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 87 (A/B)

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:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W-20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-11	10 YR 2/1	100					SL	
11-19	10 YR 2/1	100					SL	
19-24	7.5 YR 3/1	100					Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay

Depth (inches): 19-24

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cedar Creek City/County: Sampson Sampling Date: Jan-29-2013

Applicant/Owner: EEP State: NC Sampling Point: W-21

Investigator(s): G Lankford Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): nearly level Slope (%): <1%

Subregion (LRR or MLRA): LRR P/MLRA 133A Lat: Long: Datum:

Soil Map Unit Name: Bibb and Johnston soils, frequently flooded 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 ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:

Site is along UT-1 to Great Coharie Creek.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ 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)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 16

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-21

Tree Stratum (Plot size: 20 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liquidambar styraciflua	35	Yes	FAC
2. Acer rubrum	30	Yes	FAC
3. Nyssa sylvatica	20	Yes	FAC
4.			
5.			
6.			
	85	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: _____)			
1. Magnolia virginiana	10	Yes	FACW
2. Ilex opaca	5	Yes	FAC
3. Vaccinium corymbosum	5	Yes	FACW
4. Ligustrum sinense	3	No	FAC
5.			
6.			
	23	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: _____)			
1. Arundinaria gigantea	3	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	3	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: _____)			
1. Vitis rotundifolia	6	Yes	FAC
2. Smilax rotundifolia	3	Yes	FAC
3.			
4.			
5.			
	9	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 9 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

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:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W-21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10 YR 3/2	100					SiL	
5-10	N 2.5/	100					SiL	
10-21	10 YR 3/1	75	10 YR 4/3	25	C	M	Sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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 – Atlantic and Gulf Coastal Plain Region

Project/Site: Cedar Creek City/County: Sampson Sampling Date: Jan-29-2013

Applicant/Owner: EEP State: NC Sampling Point: W-22

Investigator(s): G Lankford Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): nearly level Slope (%): <1%

Subregion (LRR or MLRA): LRR P/MLRA 133A Lat: Long: Datum:

Soil Map Unit Name: Bibb and Johnston soils, frequently flooded 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 ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

Site is along UT-1 to Great Coharie Creek.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ 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)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No ✓	Depth (inches): ____
Water Table Present?	Yes ____	No ✓	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ✓	No ____	Depth (inches): -2

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adjacent to vernal pool.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-22

Tree Stratum (Plot size: 30 foot radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	45	Yes	FAC
2. Liquidambar styraciflua	20	Yes	FAC
3.			
4.			
5.			
6.			
	65	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
	0	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 30 foot radius)			
1. Ligustrum sinense	10	Yes	FAC
2. Carpinus caroliniana	10	Yes	FAC
3. Symplocos tinctoria	5	No	FAC
4. Ilex opaca	3	No	FAC
5.			
6.			
	28	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 foot radius)			
1. Microstegium vimineum	50	Yes	FAC
2. Arundinaria gigantea	3	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	53	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 foot radius)			
1. Vitis rotundifolia	3	Yes	FAC
2. Smilax rotundifolia	2	Yes	FAC
3.			
4.			
5.			
	5	= Total Cover	

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

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:	0 (A)		0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W-22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	N 2.5/	100					SL	
6-13	N 2.5/	100					CL	
13-24	10 YR 4/1	90	10 YR 5/4	10	C	PL	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ___ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ✓ Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay

Depth (inches): 13-24

Hydric Soil Present? **Yes** ☑ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Cedar Creek City/County: Sampson Sampling Date: Jan-29-2013

Applicant/Owner: EEP State: NC Sampling Point: W-23

Investigator(s): G Lankford Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): level Slope (%): <1%

Subregion (LRR or MLRA): LRR P/MLRA 133A Lat: Long: Datum:

Soil Map Unit Name: Bibb and Johnston soils, frequently flooded 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	**Is the Sampled Area within a Wetland?** Yes No ✓
Hydric Soil Present?	Yes ✓ No	
Wetland Hydrology Present?	Yes ✓ No	

Remarks:

Site is along UT-1 to Great Coharie Creek. Point is located in old clear-cut where trees did not regenerate rapidly. Multi-stem stump sprouts are typical. Hummock/swale micro-topography.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ 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)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ✓ No ____ Depth (inches): -7

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrology is high groundwater from slope seepage above flood plain. Shallow swales have up to 6 inches standing water.

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: W-23

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
	0 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Shrub Stratum (Plot size: 30 foot radius)			
1. Liquidambar styraciflua	10	Yes	FAC
2. Acer rubrum	5	Yes	FAC
3. Persea borbonia	5	No	FACW
4.			
5.			
6.			
	20 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30 foot radius)			
1. Scirpus cyperinus	28	Yes	OBL
2. Microstegium vimineum	8	No	FACW
3. Juncus effusus	5	No	OBL
4. Persicaria setacea	5	No	OBL
5. Arundinaria gigantea	3	No	FACW
6.			
7.			
8.			
9.			
10.			
11.			
	49 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30 foot radius)			
1. Vitis rotundifolia	3	Yes	FAC
2. Smilax rotundifolia	2	Yes	FAC
3.			
4.			
5.			
	5 = Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

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: 0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: W-23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/1	100					mucky L	
3-18	10 YR 2/1	100					SL	
18-28	10 YR 2/1	60	10 YR 5/1	40	D	M	SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Organic Bodies (A6) **(LRR P, T, U)**
- ✓ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ___ Muck Presence (A8) **(LRR U)**
- ___ 1 cm Muck (A9) **(LRR P, T)**
- ___ Depleted Below Dark Surface (A11)
- ✓ Thick Dark Surface (A12)
- Coast Prairie Redox (A16) **(MLRA 150A)**
- Sandy Mucky Mineral (S1) **(LRR O, S)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ✓ Dark Surface (S7) **(LRR P, S, T, U)**
- ___ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ___ Thin Dark Surface (S9) **(LRR S, T, U)**
- Loamy Mucky Mineral (F1) **(LRR O)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Marl (F10) **(LRR U)**
- ___ Depleted Ochric (F11) **(MLRA 151)**
- ___ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- Umbric Surface (F13) **(LRR P, T, U)**
- ___ Delta Ochric (F17) **(MLRA 151)**
- ___ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR O)**
- ___ 2 cm Muck (A10) **(LRR S)**
- Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ___ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ___ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators 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:

Cedar Creek Mitigation Project

Sampson County, North Carolina

2013 Hydric Soil Assessment

Prepared for
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George Lankford, NC LSS # 1223

August 2013

Soil Scientist Seal

This report describes the results of this soil evaluation. Any subsequent transfer of the report by the user shall be made by transferring the complete report, including figures, maps, appendices, all attachments and disclaimers.

1.0 Introduction

1.1 Project Description

The Cedar Creek Stream and Wetland Mitigation Project is in Sampson County, North Carolina. The site is approximately 3.1 miles southwest of Clinton, NC (Figure 1). The site is approximately 60 acres located immediately south of the Sampson-Clinton Airport and access is off of West Main Street (SR 1228).

The site is currently in agricultural production with cultivated row crops. The project site is located along the floodplain of three Unnamed Tributaries (UT) to Great Coharie Creek. The soils in the project area were evaluated for the presence of hydric soil and hydric soil indicators.

1.2 General Watershed Information

The site consists of a main Unnamed Tributary flowing in a westerly direction with two small unnamed tributaries entering along the north bank (Figure 2). The project begins at Boykin Bridge Road (SR 1214) immediately downstream of Boykin Lake. This is a relatively large watershed where land use is a mix of residential developments, cropland, concentrated animal feed operations CAFOs, and forested land. Downstream of the project area, the tributary flows into Great Coharie Creek. The site is adjacent to the Sampson-Clinton Airport. Land use adjacent to the site is forestry and agriculture, and the airport.

1.3 Methodology

A series of soil borings were performed to described and verify the presence of hydric soil and determine the extent along the floodplain. These soil borings document the presence of hydric soil indicators within 12 inches of the soil surface where present within the project area. Where disturbance was noted, hydric characteristics below 12 inches depth were described. Soils located within the floodplain have similar characteristics to Bibb and Johnston soils mapping unit. The boring observations do not contain adequate detail to classify these soils.

Hydric soil indicators develop over time under saturated conditions. The characteristic indicators are formed in an anaerobic environment predominantly by accumulation or loss of iron, manganese, sulfur, or carbon compounds (organic matter). Many of these indicators remain long after saturated conditions have been removed by man-made alterations. Hydric soils are therefore typically identified by color and color patterns created by the chemical changes formed under past anaerobic conditions, whether these conditions currently exist due to drainage modifications. Drainage modifications at this site include crowning, ditch construction, drainage tiles, and dredging of channels.

Indicators of hydric soil typically are mostly found within the upper 12 inches of the soil and consist of texture, color and color patterns. Dark colors indicate accumulation of organic matter, gray colors indicate migration or depletion of minerals, and bright colors indicate concentration of minerals. Hydric soils have soil matrix colors with a chroma 2 or less within the top 12 inches and may contain various color mottles and usually occupy the lowest part of the landscape. They are often located near the streams and ditches. The presence of Hydric Indicators indicates a soil has undergone saturated conditions in the past, but does not verify current conditions of saturation.

Soil profiles across the study area were evaluated for morphologic characteristics and divided into two mapping units for the site. These map units are;

- Soils having hydric indicators within 12 inches;
- Soils lacking hydric indicators.

Using criteria based on "Field Indicators of Hydric Soils in the United States" (USDA, NRCS, 2010, Version 7.0), 20.35 acres were identified that show hydric characteristics within 12 inches, excluding Jurisdictional Wetlands. Indicators valid for the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region* (V*ersion 2.0*) were used. Additionally, areas having jurisdictional hydrology were also delineated. The project is located in Land Resource Region (LLR) P (Inner Coastal Plain) and in Major Land Resource Area (MLRA) 133A (Southern Coastal Plain)

2.0 Site Soils

2.1 NRCS Soil Survey

The property is located within the Johnston-Bibb soil association. This association is found on nearly level, poorly drained and very poorly drained on floodplains of streams and terraces. The surface is generally loamy or sandy with loamy or sandy subsoil.

Soils on these floodplains are mapped by the NRCS as Bibb and Johnston soils (Figure 3). This soil is composed of two similar soils mapped as a single map unit. Bibb and Johnston soils formed in sandy and loamy alluvium and are found on the toeslope and floodplain. The Bibb and Johnston soils are poorly and very poorly drained are frequently flooded. The Bibb and Johnston soils map unit is listed on the NRCS hydric soil list as hydric (80 percent undrained). The surrounding upland soils are mapped as Johns fine sandy loam and Marvyn loamy sand. The surrounding upland slopes range from 6 to 12 percent.

2.2 On-Site Soil Investigation

During the site evaluation numerous soil borings were taken throughout the project area and 23 profiles were recorded (Appendix). Three areas of hydric soil were found along the right bank of UT1 and along UT3. This report describes soils on the right bank of UT1 and along UT3 where soils are lacking jurisdictional hydrology due to drainage modifications. The area on the right bank appears to lack adequate hydrology for jurisdictional wetland due to ditching and contouring of the cultivated field along the floodplain. Jurisdictional Wetlands were found along the left bank of UT1 (Figure 4). The Jurisdictional Wetlands are not addressed in this report and a JD has been issued for those areas. Three hydric soil areas were delineated on the floodplain of UT1 and UT3 are shown as A, B, and C on Figure 4.

Area A

Hydric soil Area A extends from the pond on UT3 to the floodplain of UT1 and the cultivated field. It lies within a shallow concave-linear valley feature. UT3 is a deeply incised channel that has been straightened and moved from the topographic low. At the cultivated field, it has been redirected west along the upper edge of the field to flow toward Great Coharie Creek. The channel is 4 to 6 feet deep and likely provided extensive groundwater depletion within the valley feature. Hydric soil area A is approximately 4.96 acres.

Area B
Area B is along the floodplain of UT1, extending from a crossing at the downstream end along the floodplain for approximately 1,200 feet upstream. It is located in a concave-concave landform directly below UT3 and Area A. It is separated from Area A by an excavated ditch and elevated farm path along the upper field edge. Two ditches drain surface runoff and groundwater from this area to UT1. A small headcut has formed at the downstream end where runoff enters UT1. Hydric soil area B is approximately 8.18 acres.

Area C
Area C is along the floodplain of UT1, extending from above Area B on the floodplain if UT1 for approximately 1,500 feet upstream to where UT2 enters. It is located along a concave-linear floodplain with one small bowl shaped concave-concave feature. One ditch drains surface runoff and groundwater from this area to UT1. A small headcut has formed from the cultivated field where runoff enters UT1. UT2 has been redirected along the edge of the field and enters upstream from the natural valley features. Hydric soil area C is approximately 7.21 acres.

Soils typically had a surface layer 5 to 18 inches thick black sandy loam. this horizon lacks mottles. This was underlain by a black to dark brown horizon, typically with distinct and common yellowish brown mottles. Above the floodplain of Cedar Creek, a mucky modifier for surface texture was found in some of the borings. A few profiles were found with a subsoil of heavier sandy clay loam or clay loam. A typical soil boring log is shown in Table 1 below.

Table 1. Typical Hydric Soil Profiles (non-jurisdictional areas)

Depth (inches)	Color		Mottle Percentage	Texture
	Matrix	Mottle		
Soil Boring #1				
0 - 10	7.5YR 2.5/1			Sandy Loam
10 - 21	7.5YR 2.5/1			Clay Loam
21 - 29	7.5YR 2.5/1	7.5YR 4/2	10%	Sandy Clay
29 - 34	7.5YR 2.5/1	7.5YR 5/3	15%	Sandy Clay Loam
Hydric Indicator	A12-Thick Dark Surface F13-Umbric Surface			
Soil Boring #12				
0 - 20	10YR 2/1			Sandy Loam
20 - 23	10YR 2/1	10YR 3/2	10%	Sandy Loam
23 - 35	10YR 2/1	10YR 3/2	15%	Sandy Loam
Hydric Indicator	A12-Thick Dark Surface F13-Umbric Surface			
Soil Boring #15				
0 - 10	10YR 2/1			Sandy Loam
10 - 20	10YR 2/1	10		Loamy Sand
20 - 31	10YR 5/2	20		Sandy Loam
Hydric Indicator	A12-Thick Dark Surface F13-Umbric Surface			

Based upon field observation, these areas have significantly altered hydrology due to the drainage modification for the agricultural fields. These modifications have increased the rate of surface runoff and lowered the groundwater elevation throughout the area containing hydric soil on the right bank of the channel. Modifications observed include crowning, ditching, channel dredging, and channel flow diversion.

3.0 Conclusion

Hydric soils were located in three areas on the Cedar Creek project. These areas occur along two unnamed tributaries and have been impacted by the agricultural row crops, channel dredging, and ditching.

This report describes the results of this soil evaluation. Any subsequent transfer of the report by the user shall be made by transferring the complete report, including figures, maps, appendices, all attachments and disclaimers. The standard of this report follows Standard of Practice based on the standard Draft CSSC A-0002-01.

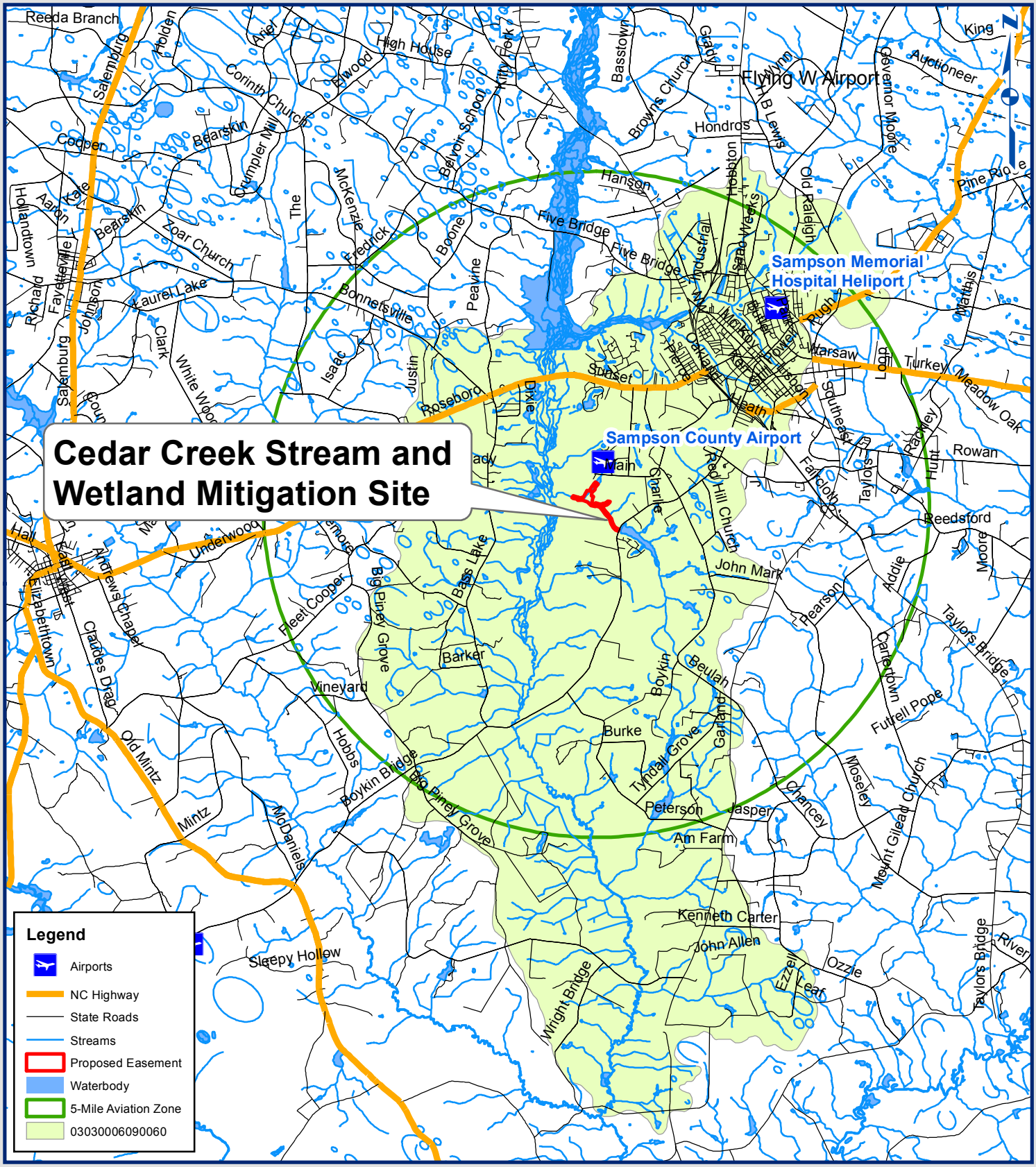
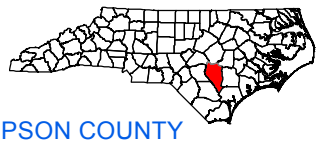


Figure 1.
Project Vicinity Map
Cedar Creek Stream and Wetland Mitigation Site

0 1 2 4 Miles

1 inch = 2 miles



SAMPSON COUNTY
Scale: NTS

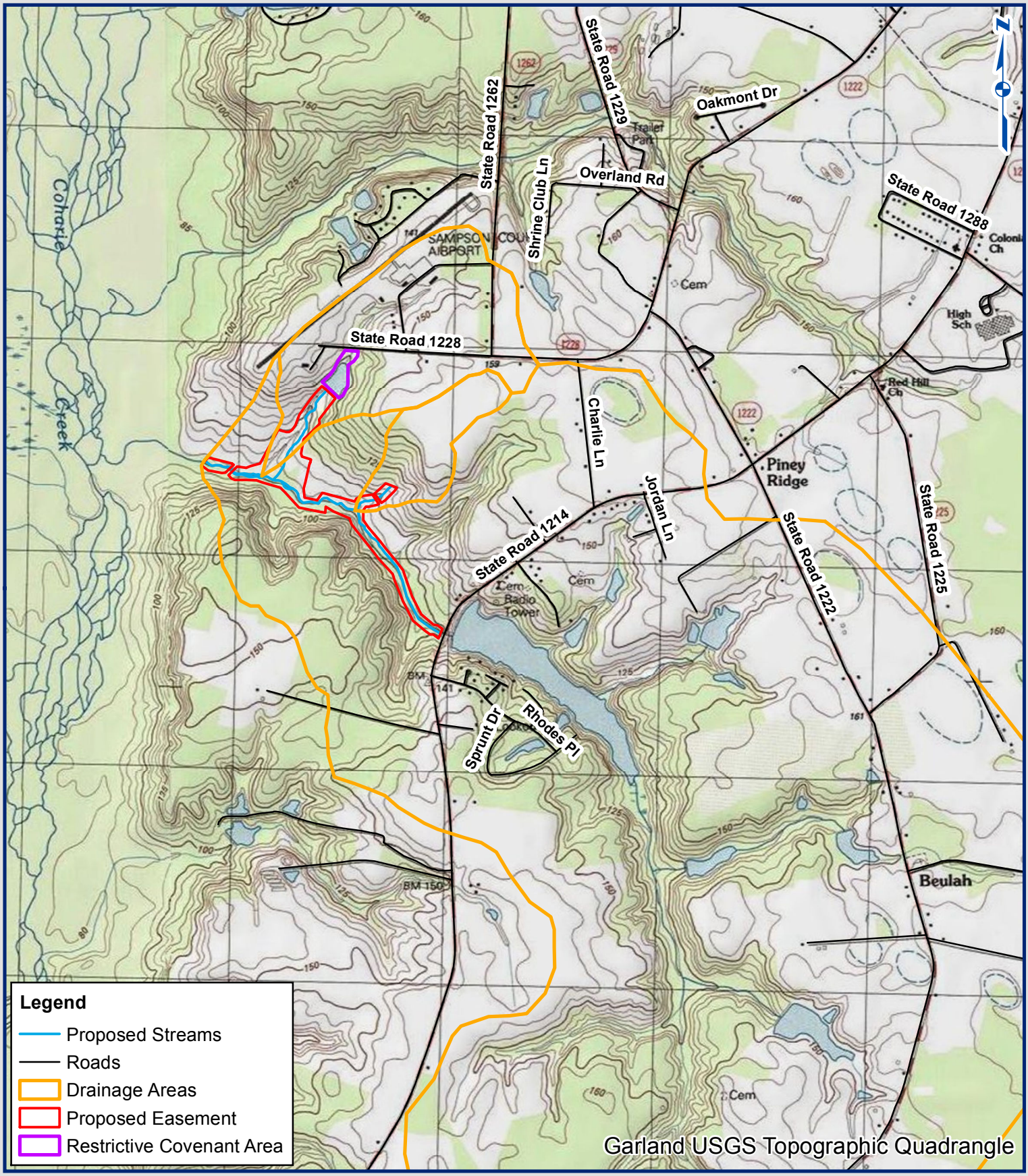


Figure 2.
USGS Map
Cedar Creek Stream and Wetland Mitigation Site

0 1,000 2,000 4,000 Feet

1 inch = 2,000 feet

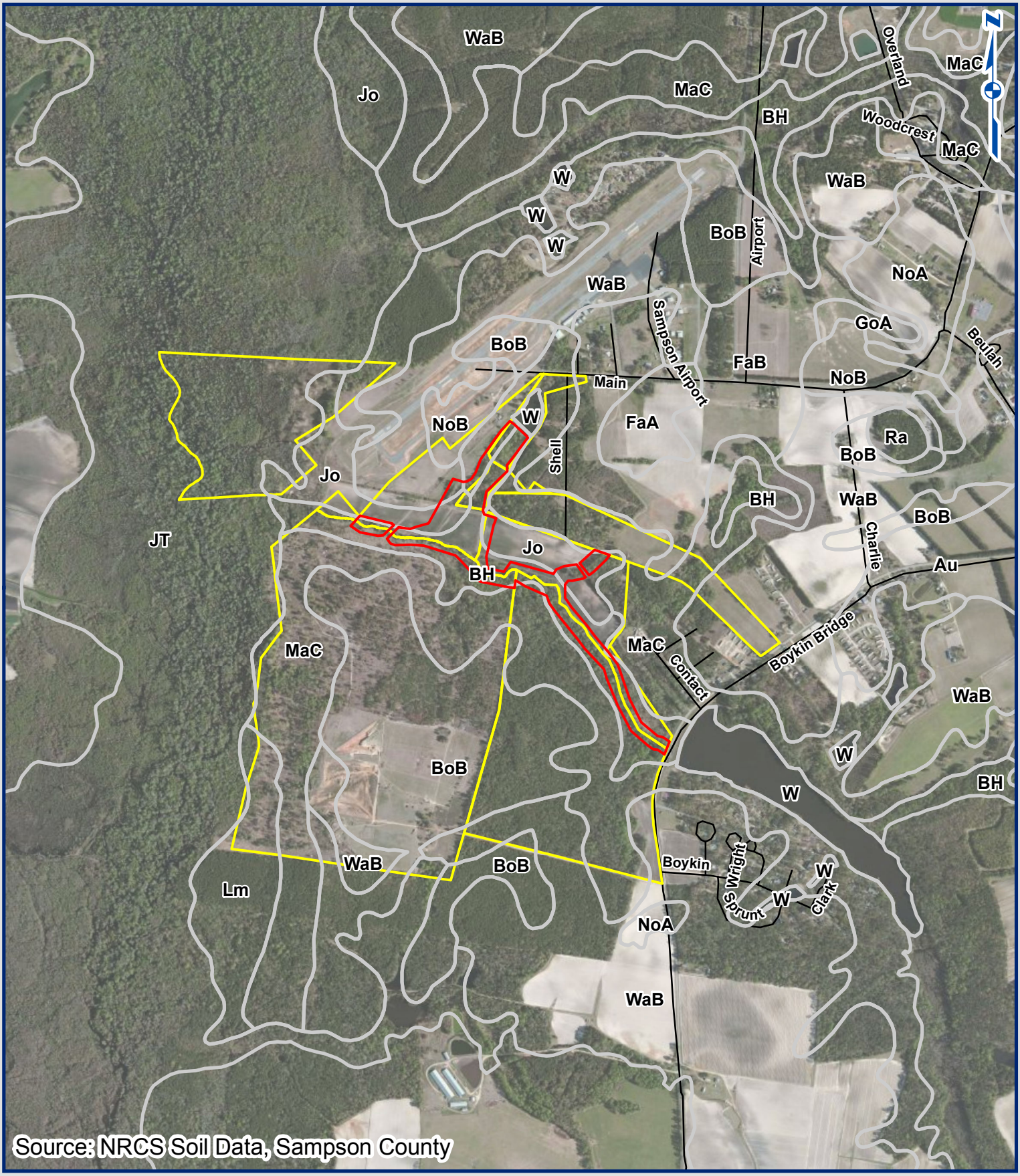


Figure 3.
NRCS Soils Map
Cedar Creek Stream and Wetland Mitigation Site

0 750 1,500 3,000 Feet

1 inch = 1,500 feet

Legend

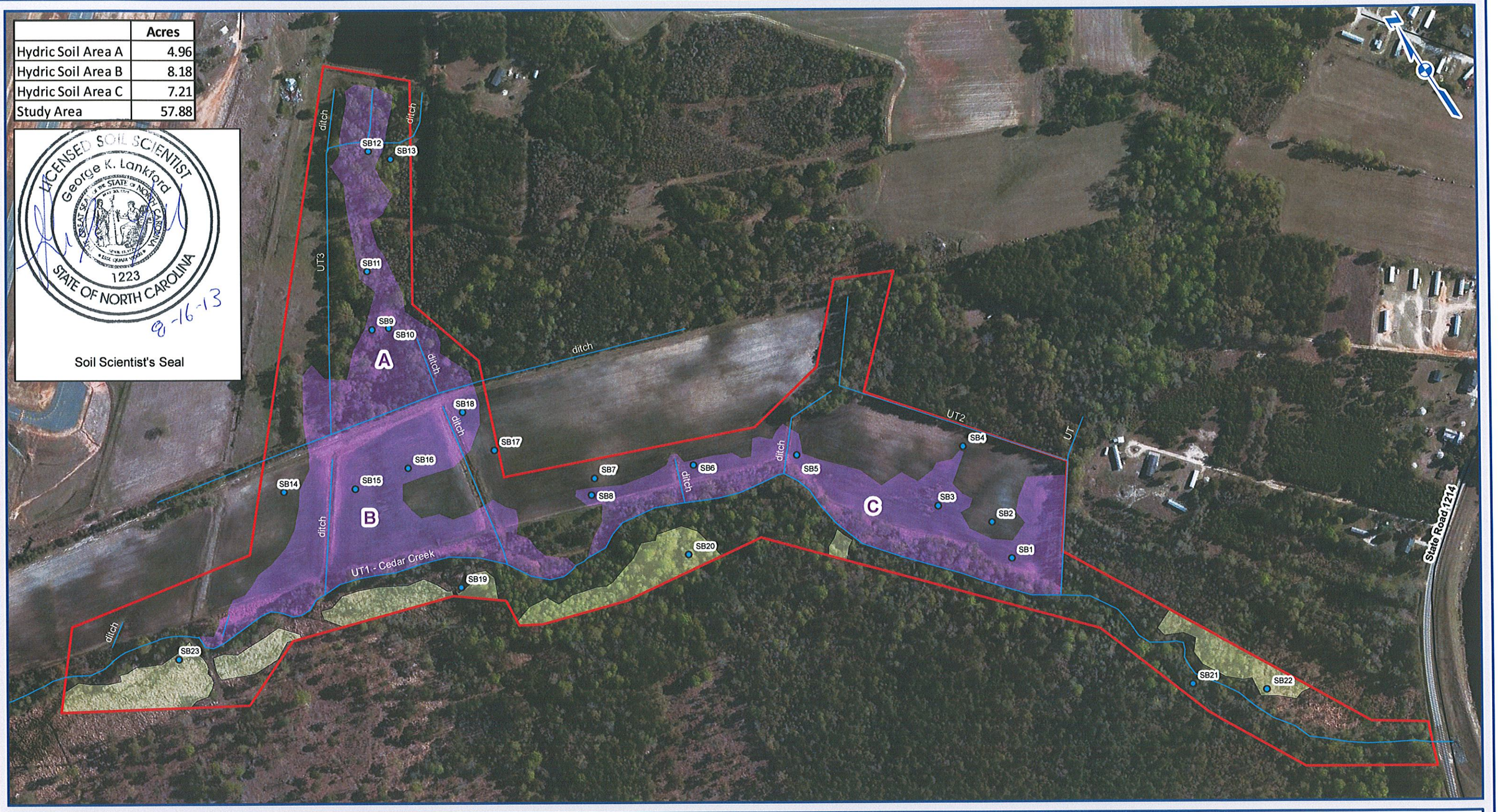
- Proposed Streams
- Proposed Easement
- Sampson County Soils
- Target Parcels

	Acres
Hydric Soil Area A	4.96
Hydric Soil Area B	8.18
Hydric Soil Area C	7.21
Study Area	57.88

LICENSED SOIL SCIENTIST
George K. Lankford
1223
STATE OF NORTH CAROLINA

08-16-13

Soil Scientist's Seal



EBX

0 150 300 600 Feet

1 inch = 300 feet

Figure 4
Delineated Soils Map
Cedar Creek Stream and Wetland Mitigation Site

- Soil Borings
- Stream Channels
- Roads
- Study Area
- Jurisdictional Wetlands
- Hydric Soils

APPENDIX

Cedar Creek Soil Boring Profile Log
January 29-31, 2013

Boring	Depth		Color		Redox Features			Texture	Notes	Hydric Indicator
No.	From	To	Matrix	Mottle	Percent	Type	Location			
SB 01	0	10	7.5YR 2.5/1					Sandy Loam	Cultivated field Water table at -6 inches Depth 21-29 restrictive-massive	A12-Thick Dark Surface F13-Umbric Surface
	10	21	7.5YR 2.5/1					Clay Loam		
	21	29	7.5YR 2.5/1	7.5YR 4/2	10%	D	M	Sandy Clay		
	29	34	7.5YR 2.5/1	7.5YR 5/3	15%	D	M	Sandy Clay Loam		
SB 02	0	5	10YR 2/1					Sandy Loam	Cultivated field Water table at -16 inches	No Hydric Indicators
	5	15	10YR 5/3					Loamy Sand		
	15	18	10YR 6/3					Loamy Sand		
	18	46	10YR 6/3					Sand		
SB 03	0	17	7.5YR 2.5/1					Sandy Loam	Cultivated field Water table at -4.5 inches Depth 40-46 varigated	A12-Thick Dark Surface F13-Umbric Surface
	17	35	7.5YR 2.5/1					Silt Loam		
	35	40	7.5YR 3/1	7.5YR 4/2	20%	C	PL	Sandy Clay Loam		
	--	--	--	7.5YR 3/3	5%	C	PL	--		
	40	46	7.5YR 3/2	7.5YR 2.5/1	50%	C	M	Sandy Loam		
SB 04	0	7	7.5YR 2.5/1					Sandy Loam	Cultivated field Water table at -9 inches	No Hydric Indicators
	7	18	7.5YR 3/3					Loamy Sand		
	18	22	7.5YR 5/8	7.5YR 4/3	10%	C	PL	Sandy Clay Loam		
	22	32	7.5YR 5/2	7.5YR 5/8	15%	C	PL	Sandy Clay		
SB 05	0	7	7.5YR 2.5/1					Sandy Loam	Cultivated field Water table at -17 inches Depth 40-46 restrictive-massive	A12-Thick Dark Surface F13-Umbric Surface
	7	20	7.5YR 2.5/1					Sandy Clay Loam		
	20	33	7.5YR 2.5/1	7.5YR 3/2	10%	D	M	Sandy Clay Loam		
SB 06	0	18	7.5YR 2.5/1	10YR 4/2				Sandy Loam	Cultivated field No hydrology	A12-Thick Dark Surface F13-Umbric Surface
	18	34	10YR 4/2	10YR 3/1	30%	D	PL	Sandy Loam		
SB 07	0	5	10YR 3/3					Sandy Loam	Cultivated field No hydrology	No Hydric Indicators
	5	18	10YR 5/8	10YR 5/3	7%	D	PL	Sandy Loam		
	18	25	10YR 5/2	10YR 5/8	12%	C	PL	Sandy Clay Loam		
	--	--	--	2.5YR 4/8	10%	C	PL	--		
SB 08	0	12	7.5YR 2.5/1					Sandy Loam	Cultivated field No hydrology	A12-Thick Dark Surface F13-Umbric Surface
	12	27	7.5YR 4/1	7.5YR 5/1	5%	D	M	Sandy Loam		
SB 09	0	5	10YR 2/1					Sandy Loam	Forested Saturated at 27 inches	A12-Thick Dark Surface
	5	7	10YR 3/1	10YR 2/1	10%	C	PL	Loamy Sand		
	7	16	10YR 5/2	10YR 5/8	5%	C	PL	Sandy Clay		
	16	27	10YR 4/2	10YR 5/2	30%	D	M	Sandy Loam		
SB 10	0	12	10YR 2/1					mucky Loam	Forested Water table at -10 inches	A7-Mucky Mineral A12-Thick Dark Surface F13-Umbric Surface
	12	24	10YR 3/2	10YR 2/1	15%	C	PL	Sandy Loam		
	24	28	10YR 3/1					Sandy Clay Loam		
SB 11	0	5	10YR2/2					Sandy Loam	Cultivated field No hydrology Depth -17 inches buried horizon Point on spoil	F6-Redox Dark Surface
	5	17	10YR 2/1	10YR 5/6	15%	C	PL	Sandy Loam		
	17	27	7.5YR 2.5/1	7.5YR 5/1	2%	D	PL	Sandy Loam		
	27	40	10YR 2/2	10YR 2/1	4%	C	PL	Sandy Loam		

Soil Scientist Seal

NC DWQ Stream Identification Form Version 4.11

Date: 7/25/2013	**Project/Site:** Cedar Cut. UT1	**Latitude:**
Evaluator: BSH, AFM	**County:** Sampson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 50	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 28.5)	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 = 9)				
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:

NC DWQ Stream Identification Form Version 4.11

Date: 7/25/2013	Project/Site: Cedar Crk UT2	Latitude:
Evaluator: BSH, AFM	County: Sampson	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34.5	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:*

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 = 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 = 8.5)				
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:

NC DWQ Stream Identification Form Version 4.11

Date: 7/25/2003	Project/Site: Cedar Crk UT3	Latitude:
Evaluator: BSH, AFM	County: Sampson	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 40	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19)	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 = 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. 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:

NC DWQ Stream Identification Form Version 4.11

Date: 7/25/2013	Project/Site: Cedar Crk UT4	Latitude:
Evaluator: BSN, AFM	County: Sampson	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 42.5	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:*

A. Geomorphology (Subtotal = 23)	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 = 13.5)				
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)				
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:

NC DWQ Stream Identification Form Version 4.11

Date: 1/13/2014	**Project/Site:** Cedar Crk Reference	**Latitude:**
Evaluator: BSH AFM	**County:** Sampson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 45.75	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:*

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	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 13)				
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 = 8.75)				
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:

APPENDIX

Cedar Creek Soil Boring Profile Log
January 29-31, 2013

Boring No.	Depth		Color		Redox Features			Texture	Notes	Hydric Indicator
	From	To	Matrix	Mottle	Percent	Type	Location			
SB 12	0	20	10YR 2/1					Sandy Loam	Forested	A12-Thick Dark Surface
	20	23	10YR 2/1	10YR 3/2	10%	MS	PL	Sandy Loam	No hydrology	F13-Umbric Surface
	23	35	10YR 2/1	10YR 3/2	15%	MS	PL	Sandy Loam	Point surrounded by ditches	
SB 13	2	0	7.5YR 2.5/1					Oi	Forested	No Hydric Indicators
	0	3	10YR 4/3					Sandy Loam	No hydrology	
	3	7	10YR 4/4	10YR 4/2	2%	MS	PL	Sandy Loam	Point surrounded by ditches	
	7	15	10YR 5/8	10YR 5/3	8%	C	PL	Sandy Clay Loam		
SB 14	0	6	10YR 2/2					Sandy Clay Loam	Cultivated field	No Hydric Indicators
	6	15	10YR 5/6	5YR 5/8	12%	C	PL	Sandy Clay Loam	Water table at -17 inches	
	15	24	10YR 5/3	5YR 4/6	5%	C	PL	Loamy Sand		
	24	30	10YR 5/2	10YR 4/6	2%	C	PL	Loamy Sand		
SB 15	0	10	10YR 2/1					Sandy Loam	Cultivated field	A12-Thick Dark Surface
	10	20	10YR 2/1					Loamy Sand	Saturated at -13 inches	F13-Umbric Surface
	20	31	10YR 5/2					Sandy Loam	Water table at -21 inches	
SB 16	0	16	10YR 2/1					Sandy Loam	Cultivated field	A12-Thick Dark Surface
	16	25	10YR 2/1					Loamy Sand	Water table at -12 inches	F13-Umbric Surface
	25	36	10YR 2/1					Sandy Clay Loam		
SB 17	0	8	10YR 2/1					Sandy Loam	Cultivated field	No Hydric Indicators
	8	15	10YR 5/3	10YR 5/8	10%	C	PL	Sandy Clay Loam	No hydrology	
	15	29	10YR 5/2	10YR 4/6	5%	C	PL	Sandy Clay		
SB 18	0	20	10YR 2/1					Sandy Loam	Cultivated field	A12-Thick Dark Surface
	20	30	10YR 2/2	10YR 2/1	2%	D	PL	Sandy Clay Loam	Water table at -22 inches	F13-Umbric Surface
	30	39	10YR 2/1					muck	Buried horizon at 30 inches	
SB 19	0	4	10YR 2/2					Sandy Loam	Clear-cut ~3 YO	F6-Redox Dark Surface
	4	10	10YR 2/2	10YR 2/4	10%	C	M	Sandy Loam	Saturated at -9 inches	
	--	--	--	10YR 4/6	5%	C	PL	--	Water table at -15 inches	
	10	24	7.5YR 2.5/1					muck	Buried at -10	
SB 20	0	11	10YR 2/1					Sandy Loam	Bottomland Forest	F13-Umbric Surface
	11	19	10YR 2/1					Clay Loam	Water table at -14 inches	
	19	24	10YR 3/1					Clay		
SB 21	0	5	10YR 2/2					Silt Loam	Bottomland Forest	F13-Umbric Surface
	5	10	N 2.5/-					Silt Loam	Saturated at -16 inches	
	10	21	10YR 4/3	10YR 3/1	25%	C	M	Sand		
SB 22	0	6	N 2.5/-					Sandy Loam	Bottomland Forest	A12-Thick Dark Surface
	6	13	N 2.5/-					Clay Loam	Saturated at -2 inches	F13-Umbric Surface
	13	24	10YR 6/1	10YR 5/2	10%	C	PL	Sandy Clay		
SB 23	0	3	10YR 2/1					mucky Loam	Bottomland Forest	A7-Mucky Mineral
	3	18	10YR 2/1					Sandy Loam	Saturated at -2 inches	A12-Thick Dark Surface
	18	28	10YR 2/1	10YR 5/1	40%	C	M	Sandy Loam		F13-Umbric Surface

Soil Scientist Seal

CHANNEL STABILITY ASSESSMENT FORM

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	
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. Channel pattern	Straight to meandering with low radius of curvature; primarily suspended load	Meandering, moderate radius of curvature; mix of suspended and bed loads; well-maintained engineered channel	Meandering with some braiding; tortuous meandering; primarily bed load; poorly maintained engineered channel	Braided; primarily bed load; engineered channel that is maintained	
3. Channel pattern (revised)	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.	
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 ration small; deeply confined; no active flood plain; levees are high and along the channel edge	
5. Bed materia 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%	
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	
7. Obstructions, including bedrock outcrops, armor layer, LWD 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. 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. 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. 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	
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	
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	
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, w/y = width-to-depth ratio

Total Score _____

Cedar Creek Mitigation Site
115 AIRPORT ROAD
Clinton, NC 28328

Inquiry Number: 3485672.2s
January 02, 2013

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

115 AIRPORT ROAD
CLINTON, NC 28328

COORDINATES

Latitude (North):	34.9674000 - 34° 58' 2.64''
Longitude (West):	78.3665000 - 78° 21' 59.40''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	740441.4
UTM Y (Meters):	3872398.5
Elevation:	97 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	34078-H3 CLINTON SOUTH, NC
Most Recent Revision:	1986
West Map:	34078-H4 BONNETSVILLE, NC
Most Recent Revision:	1986

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2009, 2010
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

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

Other Ascertainable Records

RCRA-NonGen ---- RCRA - Non Generators

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
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
IMD	Incident Management Database
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
Financial Assurance	Financial Assurance Information Listing
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH	Coal Ash Disposal Sites
PCB TRANSFORMER	PCB Transformer Registration Database
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
PRP	Potentially Responsible Parties
US AIRS	Aerometric Information Retrieval System Facility Subsystem

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

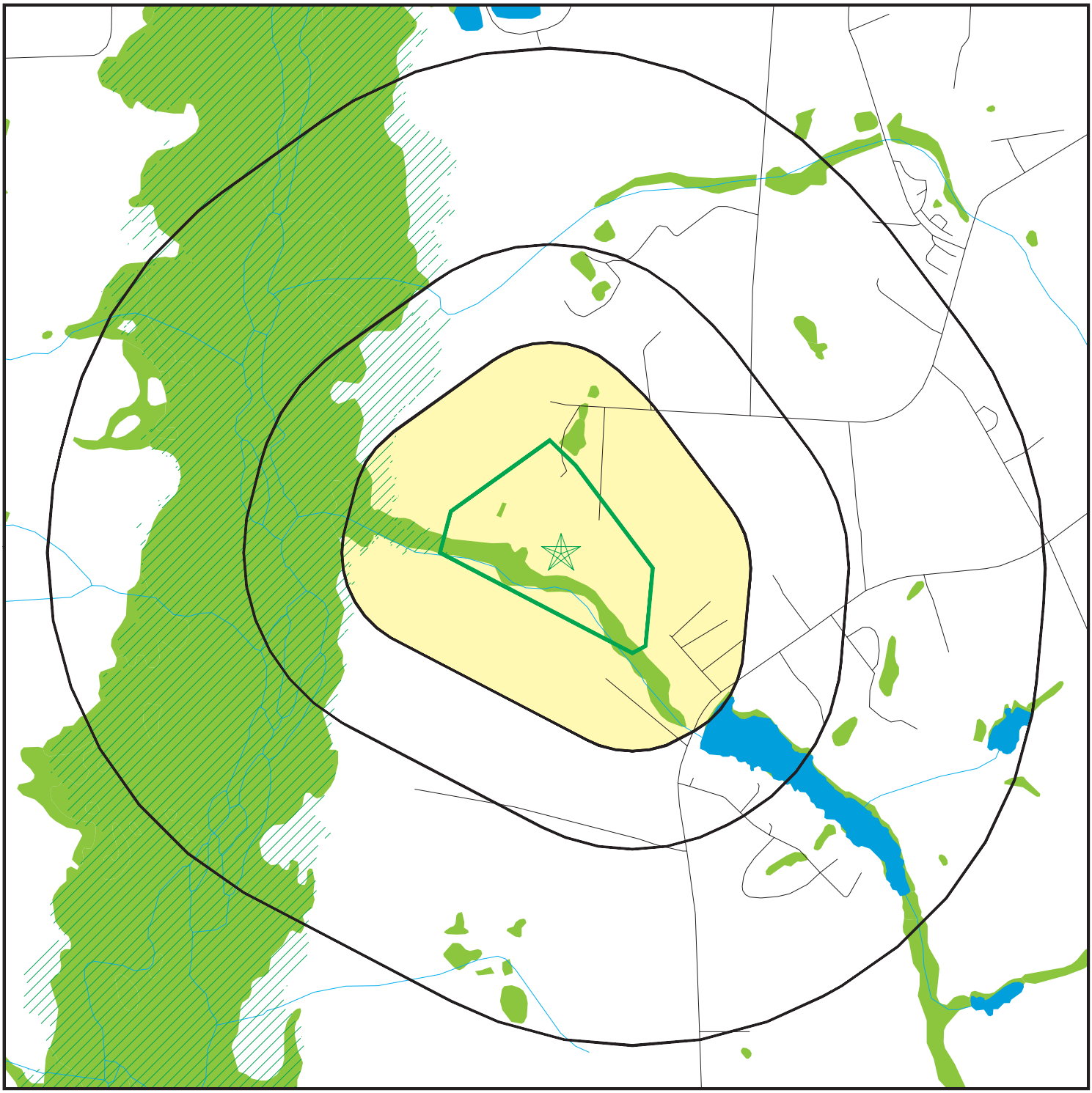
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 39 records.

Site Name	Database(s)
SBOC BULK PLANT	LUST TRUST,LUST,LAST
D & K MOTORS	LAST
SANDERSONS KWIK STOP 2	UST,FINANCIAL ASSURANCE 1
BEATRICE HARRIS--CLINTON	IMD,LUST
D. W. TATUM'S GROCERY	LUST TRUST,IMD,LUST
EVERGREEN SERVICE CENTER	IMD,LUST
BESTWAY AMOCO	LUST TRUST
DFR - SAMPSON CO. HQTRS	LUST TRUST
T-MART #12	LUST TRUST
JAMES R. VANN'S GROCERY	UST
S & J GROCERY	UST
JUNCTION GROCERY	UST
THOMAS SANITATION	UST
MALPASS GROCERY	UST
STANLEY'S GROCERY	UST
MOHASCO UPHOLSTERED FURNITURE CO	UST
ESTECH, INC.	UST
MY RESTAURANT	UST
DURWOOD SINCLAIR FARM	UST
VILLAGE MINI MART	UST
DRAUGHTON'S SUPER STOP 1	UST
CARTERS GROCERY	UST
COHARIE EQUIPMENT CO.	UST
STAR TELEPHONE MEMBERSHIP CORP.	UST
CLINTON PLANT	UST
FEED MILL BOILER	UST
BROCK'S GROCERY	UST
SAMPSON BLADEN OIL CO.	UST
DUDLEY HOME FURNISHINGS	UST
MOORE'S 76	UST
HORTICULTURAL CROPS RESRCH ST	UST
J.M. NEWMAN	UST
LANE'S GROCERY	UST
SHIPP'S GROCERY	UST
CANNADY'S WELL DRILLING	UST
EDGE CABINET CO.	UST
SBOC - C	UST
FOX'S HOLSUM BAKERY INC	UST
EVERGREEN SERVICE CENTER	UST

OVERVIEW MAP - 3485672.2s



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

0 1/4 1/2 1 Miles

Indian Reservations BIA
Oil & Gas pipelines from USGS
100-year flood zone
500-year flood zone
National Wetland Inventory
State Wetlands

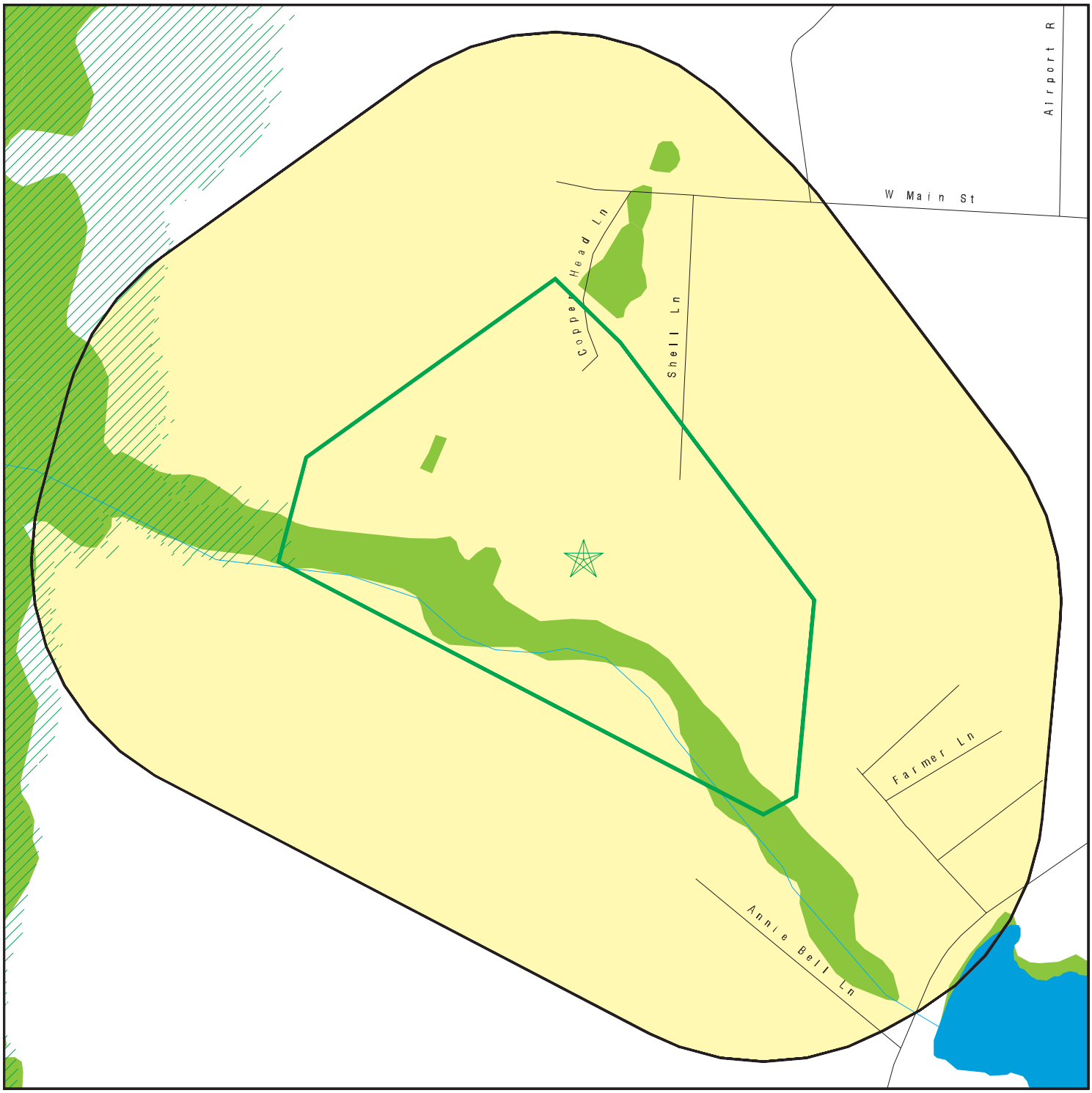
Hazardous Substance Disposal Sites

N

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: Cedar Creek Mitigation Site ADDRESS: 115 AIRPORT ROAD Clinton NC 28328 LAT/LONG: 34.9674 / -78.3665	CLIENT: WK Dickson CONTACT: George Lankford INQUIRY #: 3485672.2s DATE: January 02, 2013 1:50 pm

DETAIL MAP - 3485672.2s



- 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
- 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

0 1/8 1/4 1/2 Miles

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: Cedar Creek Mitigation Site	CLIENT: WK Dickson
ADDRESS: 115 AIRPORT ROAD Clinton NC 28328	CONTACT: George Lankford INQUIRY #: 3485672.2s
LAT/LONG: 34.9674 / -78.3665	DATE: January 02, 2013 1:50 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								
Federal NPL site list								
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
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
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
Federal institutional controls / engineering controls registries								
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
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
NC HSDS	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
OLI	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
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
State and tribal registered storage tank lists								
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
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
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
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen	0.250		0	0	NR	NR	NR	0
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

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
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
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
IMD	0.500		0	0	0	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
Financial Assurance	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
US AIRS	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

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

NO SITES FOUND

Count: 39 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
CLINTON	S105119693	BEATRICE HARRIS--CLINTON	1131 SUNSET AVE & HWY 24		IMD,LUST
CLINTON	S105218644	BESTWAY AMOCO	HIGHWAY 421 NORTH		LUST TRUST
CLINTON	S105219005	DFR - SAMPSON CO. HQTRS	ROUTE 6 BOX 190 H		LUST TRUST
CLINTON	S105219105	T-MART #12	HWY 701 & HWY 24		LUST TRUST
CLINTON	S105764368	D. W. TATUM'S GROCERY	HWY 421		LUST TRUST,IMD,LUST
EVERGREEN	S105766231	EVERGREEN SERVICE CENTER	HWY 130 & 242		IMD,LUST
CLINTON	S110051964	SBOC BULK PLANT	932 US HWY 421 NORTH	28328	LUST TRUST,LUST,LAST
CLINTON	S110629199	D & K MOTORS	6830 US HWY 421	28328	LAST
CLINTON	U001186648	FOX'S HOLSUM BAKERY INC	SMITHFIELD HIGHWAY	28328	UST
CLINTON	U001187747	SBOC - C	HWY 701 NORTH	28328	UST
CLINTON	U001191163	FEED MILL BOILER	HIGHWAY 421 SOUTH	28328	UST
CLINTON	U001191191	ESTECH, INC.	HIGHWAY 24 WEST	28328	UST
CLINTON	U001191192	COHARIE EQUIPMENT CO.	HIGHWAY 421 SOUTH	28328	UST
CLINTON	U001191203	BROCK'S GROCERY	HIGHWAY 421	28328	UST
CLINTON	U001191204	SAMPSON BLADEN OIL CO.	HWY 421 N	28328	UST
CLINTON	U001191585	STAR TELEPHONE MEMBERSHIP CORP.	P.O. BOX 348, HIGHWAY 421 NORT	28328	UST
CLINTON	U001191748	MOHASCO UPHOLSTERED FURNITURE CO	HIGHWAY 24 EAST, P.O. BOX 409	28328	UST
CLINTON	U001191936	EDGE CABINET CO.	HIGHWAY 701 NORTH	28328	UST
CLINTON	U001202337	DRAUGHTON'S SUPER STOP 1	3900 DRAUGHONS HWY/RT6 BOX 266	28328	UST
CLINTON	U003091644	SANDERSONS KWIK STOP 2	HIGHWAY 701 NORTH	28328	UST,FINANCIAL ASSURANCE 1
CLINTON	U003134159	HORTICULTURAL CROPS RESRCH ST	RTE 5 BOX 43	28328	UST
CLINTON	U003134566	MOORE'S 76	ROUTE 5	28328	UST
CLINTON	U003134568	VILLAGE MINI MART	ROUTE 3	28328	UST
CLINTON	U003134592	DURWOOD SINCLAIR FARM	ROUTE 3	28328	UST
CLINTON	U003134593	MY RESTAURANT	ROUTE 3	28328	UST
CLINTON	U003134594	JAMES R. VANN'S GROCERY	ROUTE 1, BOX 118-X	28328	UST
CLINTON	U003134618	CARTERS GROCERY	ROUTE 4, BOX 354-D	28328	UST
CLINTON	U003137773	CANNADY'S WELL DRILLING	ROUTE 6, BOX 344	28328	UST
CLINTON	U003143685	JUNCTION GROCERY	ROUTE 1, BOX 132	28328	UST
CLINTON	U003143790	S & J GROCERY	RFD 1 / HIGHWAY 701	28328	UST
CLINTON	U003143800	SHIPP'S GROCERY	HIGHWAY 701 NORTH (ROUTE 6)	28328	UST
CLINTON	U003561972	MALPASS GROCERY	RTE 2	28328	UST
CLINTON	U003561974	STANLEY'S GROCERY	RTE 2 BOX	28328	UST
CLINTON	U003562270	CLINTON PLANT	HIGHWAY 421 NORTH	28328	UST
CLINTON	U003562275	DUDLEY HOME FURNISHINGS	HIGHWAY 421 NORTH	28328	UST
CLINTON	U003562280	J.M. NEWMAN	ROUTE 6	28328	UST
CLINTON	U003562335	THOMAS SANITATION	ROUTE 1, BOX 10	28328	UST
CLINTON	U003562342	LANE'S GROCERY	ROUTE 6	28328	UST
EVERGREEN	U004138796	EVERGREEN SERVICE CENTER	ROUTE 1, BOX 44	28328	UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 10/11/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 10/11/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 70

Source: EPA
Telephone: N/A
Last EDR Contact: 10/11/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/27/2011
Date Data Arrived at EDR: 02/27/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 14

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/09/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 12/28/2011
Date Data Arrived at EDR: 02/27/2012
Date Made Active in Reports: 03/12/2012
Number of Days to Update: 14

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 08/19/2011
Date Data Arrived at EDR: 08/31/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 132

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 11/29/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 11/29/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 11/29/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 11/29/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/18/2012
Date Data Arrived at EDR: 07/24/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/15/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 04/02/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 10/02/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Annually

State- and tribal - equivalent NPL

HSDS: Hazardous Substance Disposal Site

Locations of uncontrolled and unregulated hazardous waste sites. The file includes sites on the National Priority List as well as those on the state priority list.

Date of Government Version: 08/09/2011
Date Data Arrived at EDR: 11/08/2011
Date Made Active in Reports: 12/05/2011
Number of Days to Update: 27

Source: North Carolina Center for Geographic Information and Analysis
Telephone: 919-754-6580
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Biennially

State- and tribal - equivalent CERCLIS

SHWS: Inactive Hazardous Sites Inventory

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 08/24/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/15/2012
Number of Days to Update: 26

Source: Department of Environment, Health and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 12/21/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: List of Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 09/25/2012
Date Data Arrived at EDR: 09/27/2012
Date Made Active in Reports: 10/26/2012
Number of Days to Update: 29

Source: Department of Environment and Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Semi-Annually

OLI: Old Landfill Inventory

Old landfill inventory location information. (Does not include no further action sites and other agency lead sites).

Date of Government Version: 07/03/2012
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 08/06/2012
Number of Days to Update: 14

Source: Department of Environment & Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 11/30/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Regional UST Database

This database contains information obtained from the Regional Offices. It provides a more detailed explanation of current and historic activity for individual sites, as well as what was previously found in the Incident Management Database. Sites in this database with Incident Numbers are considered LUSTs.

Date of Government Version: 11/09/2012
Date Data Arrived at EDR: 11/14/2012
Date Made Active in Reports: 12/27/2012
Number of Days to Update: 43

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 11/14/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

LUST TRUST: State Trust Fund Database

This database contains information about claims against the State Trust Funds for reimbursements for expenses incurred while remediating Leaking USTs.

Date of Government Version: 10/12/2012
Date Data Arrived at EDR: 10/17/2012
Date Made Active in Reports: 11/06/2012
Number of Days to Update: 20

Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

LAST: Leaking Aboveground Storage Tanks
A listing of leaking aboveground storage tank site locations.

Date of Government Version: 11/09/2012
Date Data Arrived at EDR: 11/14/2012
Date Made Active in Reports: 12/27/2012
Number of Days to Update: 43
Source: Department of Environment & Natural Resources
Telephone: 877-623-6748
Last EDR Contact: 11/14/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/09/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 62
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/30/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Petroleum Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 11/09/2012
Date Data Arrived at EDR: 11/14/2012
Date Made Active in Reports: 12/27/2012
Number of Days to Update: 43
Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 11/14/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

AST: AST Database
Facilities with aboveground storage tanks that have a capacity greater than 21,000 gallons.

Date of Government Version: 09/24/2012
Date Data Arrived at EDR: 09/25/2012
Date Made Active in Reports: 11/06/2012
Number of Days to Update: 42
Source: Department of Environment and Natural Resources
Telephone: 919-715-6183
Last EDR Contact: 12/18/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 08/17/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 09/06/2012
Date Data Arrived at EDR: 09/07/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 39

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/12/2012
Date Data Arrived at EDR: 05/02/2012
Date Made Active in Reports: 07/16/2012
Number of Days to Update: 75

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 12/14/2011
Date Data Arrived at EDR: 12/15/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 26

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/02/2012
Date Data Arrived at EDR: 08/03/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 94

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 08/01/2012
Date Data Arrived at EDR: 08/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 75

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/26/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/15/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: No Further Action Sites With Land Use Restrictions Monitoring
A land use restricted site is a property where there are limits or requirements on future use of the property due to varying levels of cleanup possible, practical, or necessary at the site.

Date of Government Version: 08/24/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/15/2012
Number of Days to Update: 26

Source: Department of Environment, Health and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 12/17/2110
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 10/02/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Responsible Party Voluntary Action Sites
Responsible Party Voluntary Action site locations.

Date of Government Version: 08/24/2012
Date Data Arrived at EDR: 09/19/2012
Date Made Active in Reports: 10/15/2012
Number of Days to Update: 26

Source: Department of Environment and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 12/21/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Semi-Annually

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Projects Inventory
A brownfield site is an abandoned, idled, or underused property where the threat of environmental contamination has hindered its redevelopment. All of the sites in the inventory are working toward a brownfield agreement for cleanup and liabitliy control.

Date of Government Version: 09/30/2010
Date Data Arrived at EDR: 04/15/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 19

Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 10/11/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/10/2012
Date Data Arrived at EDR: 12/11/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/03/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: No Update Planned

HIST LF: Solid Waste Facility Listing
A listing of solid waste facilities.

Date of Government Version: 11/06/2006
Date Data Arrived at EDR: 02/13/2007
Date Made Active in Reports: 03/02/2007
Number of Days to Update: 17

Source: Department of Environment & Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 01/19/2009
Next Scheduled EDR Contact: 04/19/2009
Data Release Frequency: Quarterly

SWRCY: Recycling Center Listing
A listing of recycling center locations.

Date of Government Version: 08/06/2012
Date Data Arrived at EDR: 08/08/2012
Date Made Active in Reports: 09/13/2012
Number of Days to Update: 36

Source: Department of Environment & Natural Resources
Telephone: 919-707-8137
Last EDR Contact: 12/04/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/11/2012
Date Data Arrived at EDR: 09/12/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 54

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 12/03/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/16/2012
Date Data Arrived at EDR: 03/26/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 04/01/2012
Date Data Arrived at EDR: 04/03/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 72

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 10/02/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Annually

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/11/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 12/04/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 11/29/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/06/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 62

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/27/2012
Date Data Arrived at EDR: 03/14/2012
Date Made Active in Reports: 06/14/2012
Number of Days to Update: 92

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/18/2011
Date Data Arrived at EDR: 09/08/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 21

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/05/2012
Next Scheduled EDR Contact: 03/18/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 09/01/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 131

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/28/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 11/01/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/19/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 06/21/2011
Date Data Arrived at EDR: 07/15/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 60

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/10/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/02/2012
Next Scheduled EDR Contact: 01/21/2013
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/23/2011
Date Data Arrived at EDR: 12/13/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 79

Source: EPA
Telephone: (404) 562-9900
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/30/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Biennially

IMD: Incident Management Database

Groundwater and/or soil contamination incidents

Date of Government Version: 07/21/2006
Date Data Arrived at EDR: 08/01/2006
Date Made Active in Reports: 08/23/2006
Number of Days to Update: 22

Source: Department of Environment and Natural Resources
Telephone: 919-733-3221
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

UIC: Underground Injection Wells Listing

A listing of uncerground injection wells locations.

Date of Government Version: 11/13/2012
Date Data Arrived at EDR: 11/14/2012
Date Made Active in Reports: 12/27/2012
Number of Days to Update: 43

Source: Department of Environment & Natural Resources
Telephone: 919-807-6412
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Varies

DRYCLEANERS: Drycleaning Sites

Potential and known drycleaning sites, active and abandoned, that the Drycleaning Solvent Cleanup Program has knowledge of and entered into this database.

Date of Government Version: 09/12/2012
Date Data Arrived at EDR: 09/25/2012
Date Made Active in Reports: 10/25/2012
Number of Days to Update: 30

Source: Department of Environment & Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/08/2013
Data Release Frequency: Varies

NPDES: NPDES Facility Location Listing

General information regarding NPDES(National Pollutant Discharge Elimination System) permits.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/13/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 34

Source: Department of Environment & Natural Resources
Telephone: 919-733-7015
Last EDR Contact: 12/04/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/18/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: N/A

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/01/2012
Date Data Arrived at EDR: 10/04/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 32

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/04/2012
Next Scheduled EDR Contact: 01/14/2013
Data Release Frequency: Quarterly

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 01/18/2012
Date Data Arrived at EDR: 01/27/2012
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 34

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 12/28/2012
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/13/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/12/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 11/05/2012
Number of Days to Update: 69

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 11/16/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List
The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/16/2012
Next Scheduled EDR Contact: 11/26/2012
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/02/2012
Next Scheduled EDR Contact: 02/11/2013
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites

A listing of coal combustion products distribution permits issued by the Division for the treatment, storage, transportation, use and disposal of coal combustion products.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/04/2009
Date Made Active in Reports: 08/17/2009
Number of Days to Update: 13

Source: Department of Environment & Natural Resources
Telephone: 919-807-6359
Last EDR Contact: 11/05/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/03/2012
Date Made Active in Reports: 10/26/2012
Number of Days to Update: 23

Source: Department of Environmental & Natural Resources
Telephone: 919-508-8496
Last EDR Contact: 01/02/2013
Next Scheduled EDR Contact: 04/15/2013
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/11/2012
Next Scheduled EDR Contact: 03/25/2013
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 09/23/2011
Date Data Arrived at EDR: 10/06/2011
Date Made Active in Reports: 11/01/2011
Number of Days to Update: 26

Source: Department of Environment & Natural Resources
Telephone: 919-733-1322
Last EDR Contact: 11/14/2012
Next Scheduled EDR Contact: 02/25/2013
Data Release Frequency: Quarterly

Financial Assurance 3: Financial Assurance Information
Hazardous waste financial assurance information.

Date of Government Version: 09/30/2012
Date Data Arrived at EDR: 10/19/2012
Date Made Active in Reports: 11/29/2012
Number of Days to Update: 41

Source: Department of Environment & Natural Resources
Telephone: 919-707-8222
Last EDR Contact: 12/13/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/20/2012
Date Data Arrived at EDR: 08/20/2012
Date Made Active in Reports: 09/20/2012
Number of Days to Update: 31

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/19/2012
Next Scheduled EDR Contact: 03/04/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/16/2012
Next Scheduled EDR Contact: 01/28/2013
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 12/11/2012
Number of Days to Update: 34

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/07/2012
Next Scheduled EDR Contact: 02/18/2013
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/23/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 57

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/22/2012
Next Scheduled EDR Contact: 02/04/2013
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 06/22/2012
Date Made Active in Reports: 07/31/2012
Number of Days to Update: 39

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/26/2012
Next Scheduled EDR Contact: 03/11/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 09/27/2012
Number of Days to Update: 70

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/13/2012
Next Scheduled EDR Contact: 04/01/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Health & Human Services
Telephone: 919-662-4499

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

CEDAR CREEK MITIGATION SITE
115 AIRPORT ROAD
CLINTON, NC 28328

TARGET PROPERTY COORDINATES

Latitude (North):	34.9674 - 34° 58' 2.64''
Longitude (West):	78.3665 - 78° 21' 59.40''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	740441.4
UTM Y (Meters):	3872398.5
Elevation:	97 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	34078-H3 CLINTON SOUTH, NC
Most Recent Revision:	1986
West Map:	34078-H4 BONNETSVILLE, NC
Most Recent Revision:	1986

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

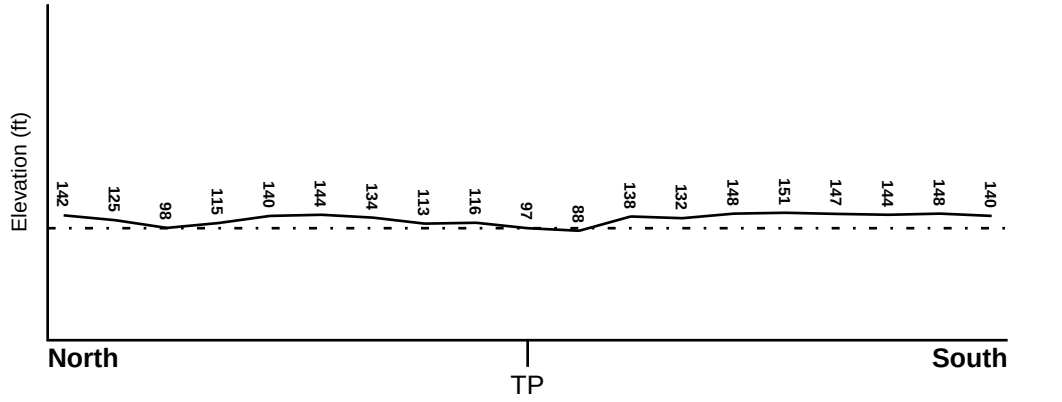
TOPOGRAPHIC INFORMATION

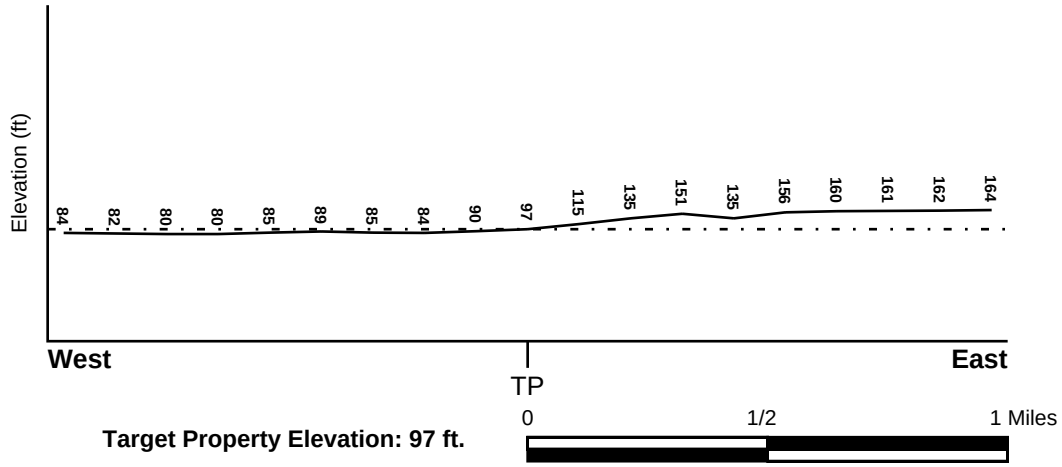
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General WNW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 97 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
SAMPSON, NC	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 37163C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
CLINTON SOUTH	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

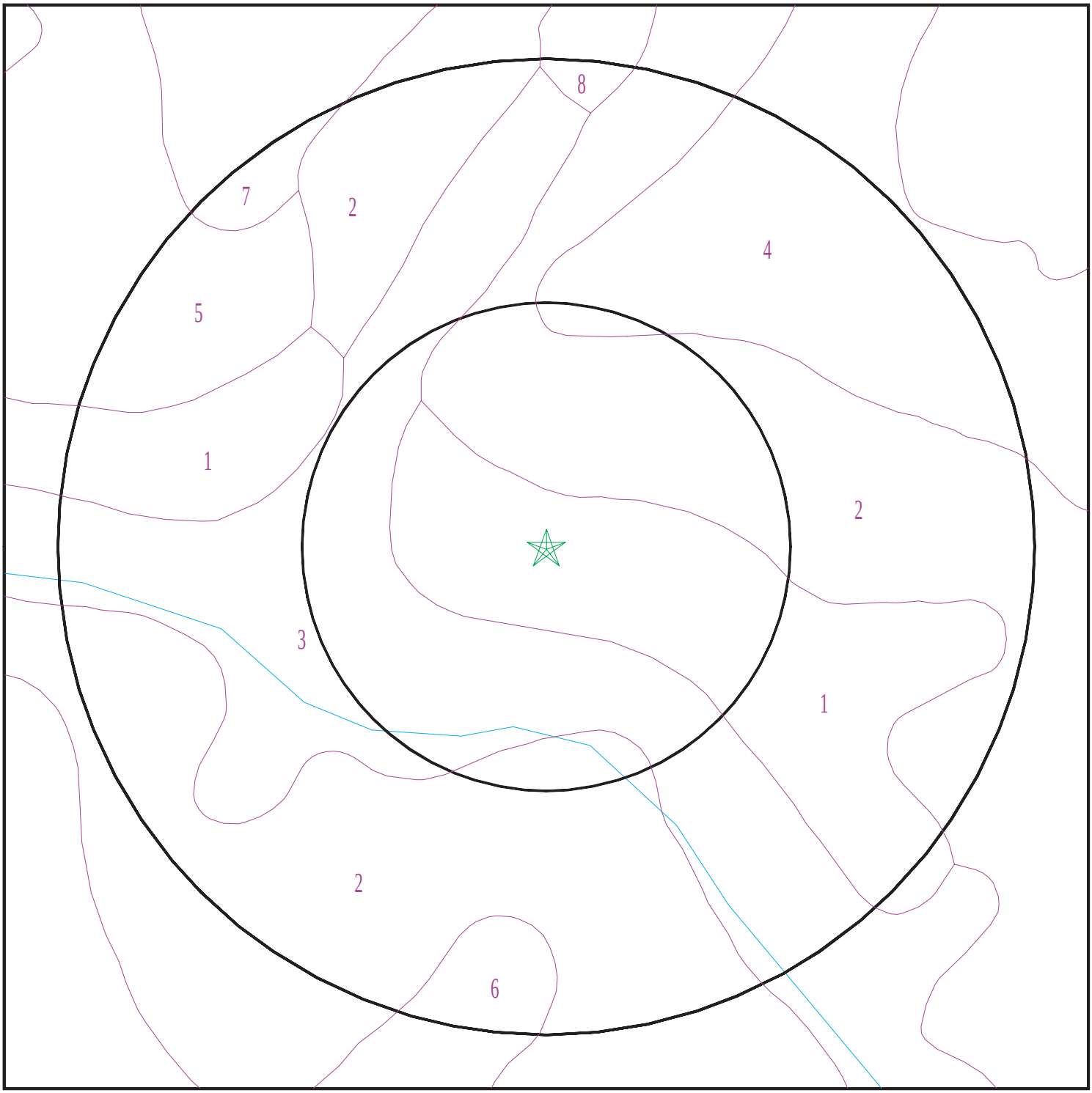
Era:	Mesozoic
System:	Cretaceous
Series:	Washita Group
Code:	lK3 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3485672.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Cedar Creek Mitigation Site	CLIENT:	WK Dickson
ADDRESS:	115 AIRPORT ROAD	CONTACT:	George Lankford
	Clinton NC 28328	INQUIRY #:	3485672.2s
LAT/LONG:	34.9674 / -78.3665	DATE:	January 02, 2013 1:50 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Johns

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 69 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 5.5 Min: 4.5
2	7 inches	11 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 5.5 Min: 4.5
3	11 inches	31 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 5.5 Min: 4.5

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	31 inches	59 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Well-graded sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 5.5 Min: 4.5

Soil Map ID: 2

Soil Component Name: Marvyn

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	3 inches	11 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6 Min: 4.5

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	11 inches	44 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6 Min: 4.5
3	44 inches	75 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6 Min: 4.5
4	0 inches	3 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 6 Min: 4.5

Soil Map ID: 3

Soil Component Name: Bibb

Soil Surface Texture: loamy sand

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 23 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42 Min: 14	Max: 5.5 Min: 3.6
2	5 inches	59 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42 Min: 14	Max: 5.5 Min: 3.6
3	59 inches	79 inches	loamy sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 42 Min: 14	Max: 5.5 Min: 3.6

Soil Map ID: 4

Soil Component Name: Faceville

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	fine sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 6 Min: 4.5
2	7 inches	12 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 6 Min: 4.5
3	12 inches	64 inches	clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 6 Min: 4.5

Soil Map ID: 5

Soil Component Name: Wagram

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	7 inches	24 inches	loamy fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5
2	24 inches	83 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5
3	0 inches	7 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5

Soil Map ID: 6

Soil Component Name: Blanton

Soil Surface Texture: sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 153 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	9 inches	51 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5
2	51 inches	96 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5
3	0 inches	9 inches	sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 42	Max: 6 Min: 4.5

Soil Map ID: 7

Soil Component Name: Norfolk

Soil Surface Texture: loamy sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 122 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
2	9 inches	14 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
3	14 inches	70 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
4	70 inches	100 inches	sandy clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5

Soil Map ID: 8

Soil Component Name: Water

Soil Surface Texture: loamy sand

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

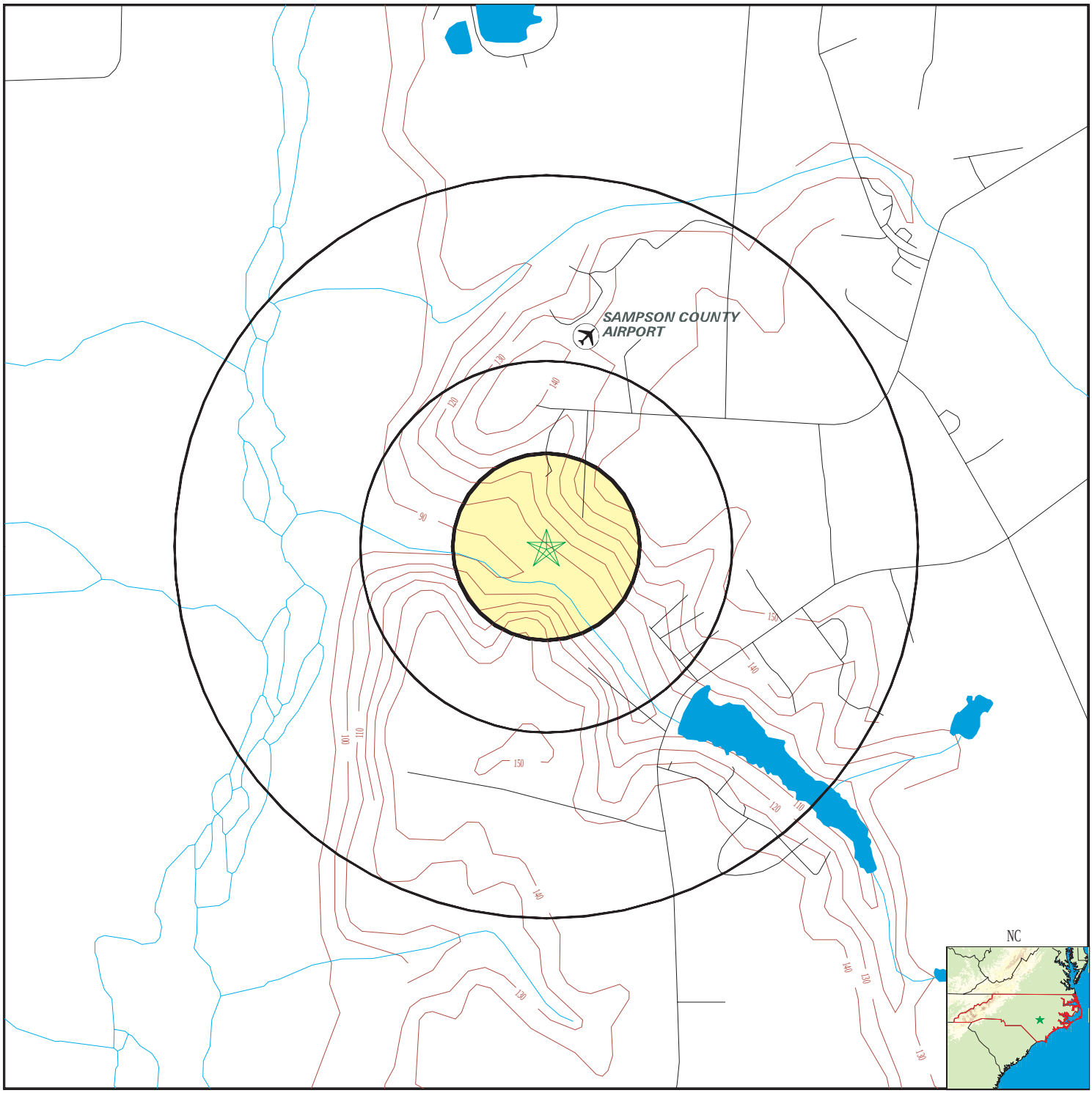
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 3485672.2s



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

SITE NAME: Cedar Creek Mitigation Site	CLIENT: WK Dickson
ADDRESS: 115 AIRPORT ROAD	CONTACT: George Lankford
Clinton NC 28328	INQUIRY #: 3485672.2s
LAT/LONG: 34.9674 / -78.3665	DATE: January 02, 2013 1:50 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for SAMPSON County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 28328

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.500 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

OTHER STATE DATABASE INFORMATION

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or hight quality natural communities, or other important ecological features.

NC Game Lands: Wildlife Resources Commission Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION

Cedar Creek Mitigation Site
115 AIRPORT ROAD
Clinton, NC 28328

Inquiry Number: 3485672.3
January 02, 2013

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

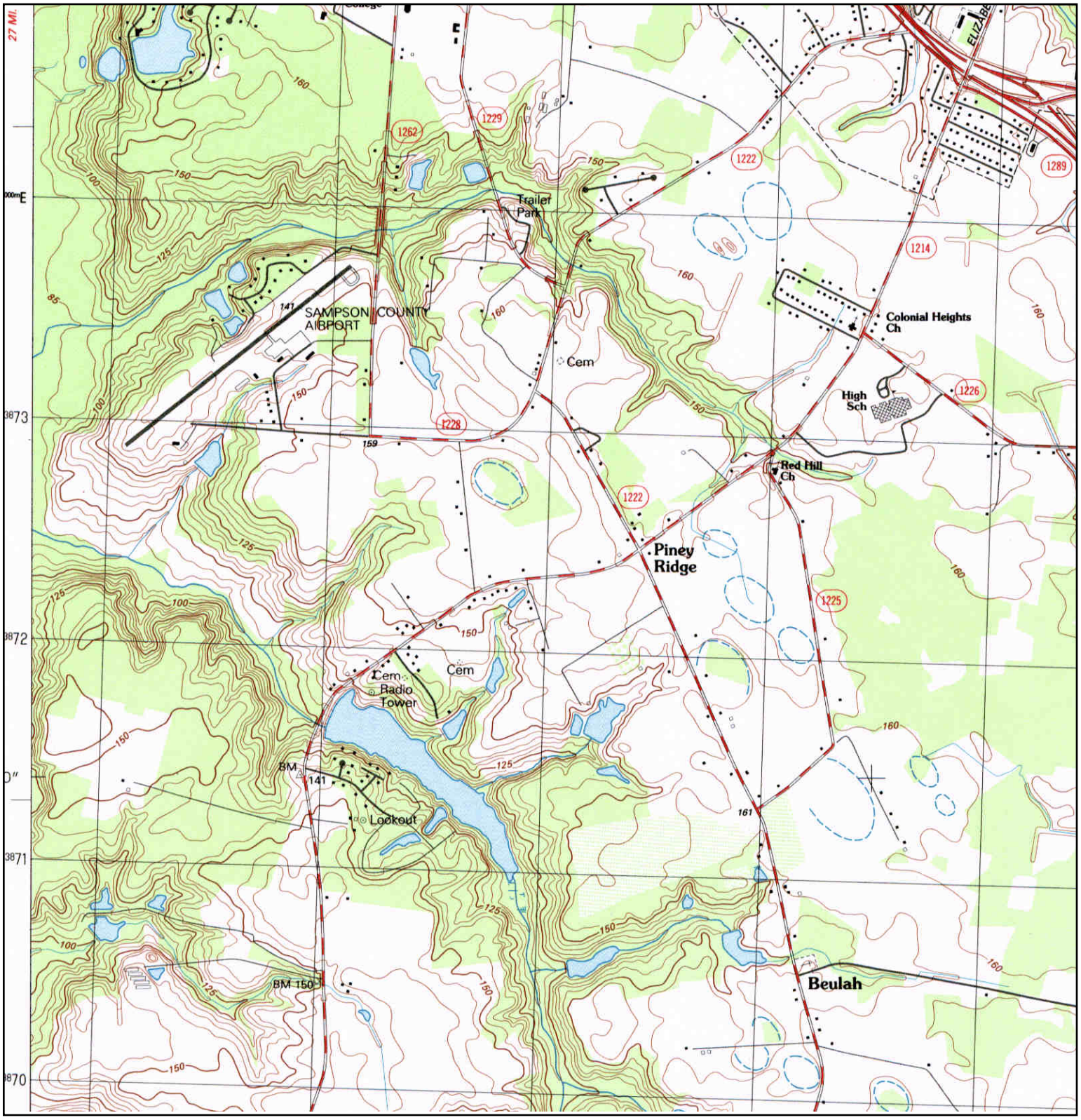
Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map

N	TARGET QUAD NAME: GARLAND MAP YEAR: 1959 SERIES: 15 SCALE: 1:62500	SITE NAME: Cedar Creek Mitigation Site ADDRESS: 115 AIRPORT ROAD Clinton, NC 28328 LAT/LONG: 34.9674 / -78.3665	CLIENT: WK Dickson CONTACT: George Lankford INQUIRY#: 3485672.3 RESEARCH DATE: 01/02/2013

Historical Topographic Map



N	TARGET QUAD NAME: CLINTON SOUTH MAP YEAR: 1986 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Cedar Creek Mitigation Site ADDRESS: 115 AIRPORT ROAD Clinton, NC 28328 LAT/LONG: 34.9674 / -78.3665	CLIENT: WK Dickson CONTACT: George Lankford INQUIRY#: 3485672.3 RESEARCH DATE: 01/02/2013

Cedar Creek Mitigation Site
115 AIRPORT ROAD
Clinton, NC 28328

Inquiry Number: 3485672.4
January 02, 2013

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

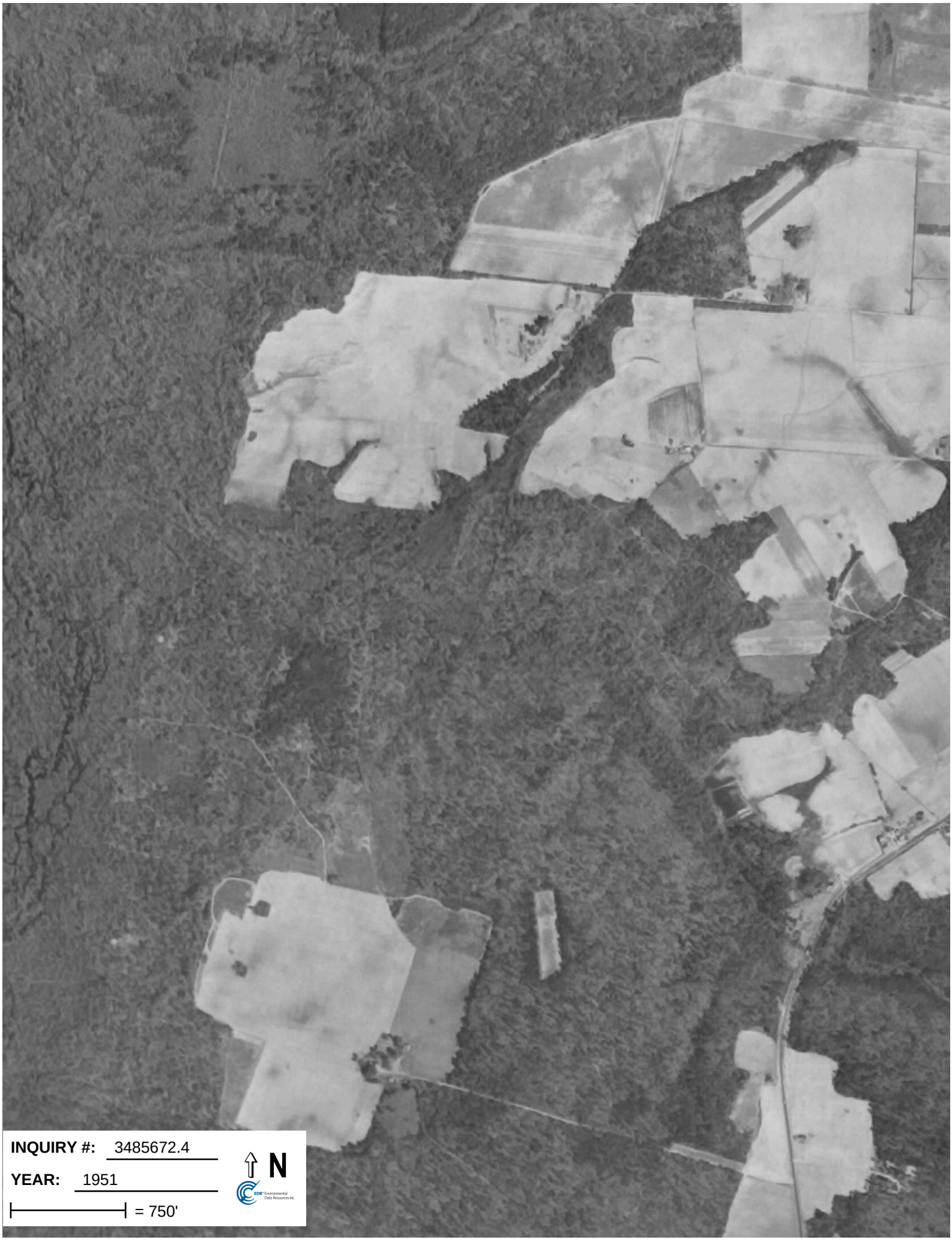
Aerial Photography January 02, 2013

Target Property:

115 AIRPORT ROAD

Clinton, NC 28328

Year	***Scale***	***Details***	***Source***
1951	Aerial Photograph. Scale: 1"=750'	Panel #: 34078-H3, Clinton South, NC;/Flight Date: April 01, 1951	EDR
1958	Aerial Photograph. Scale: 1"=750'	Panel #: 34078-H3, Clinton South, NC;/Flight Date: January 01, 1958	EDR
1981	Aerial Photograph. Scale: 1"=500'	Panel #: 34078-H3, Clinton South, NC;/Flight Date: April 02, 1981	EDR
1993	Aerial Photograph. Scale: 1"=500'	Panel #: 34078-H3, Clinton South, NC;/Composite DOQQ - acquisition dates: February 23, 1993,February 19, 1993	EDR
1998	Aerial Photograph. Scale: 1"=750'	Panel #: 34078-H3, Clinton South, NC;/Flight Date: March 11, 1998	EDR
2005	Aerial Photograph. Scale: 1"=500'	Panel #: 34078-H3, Clinton South, NC;/Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Panel #: 34078-H3, Clinton South, NC;/Flight Year: 2006	EDR
2008	Aerial Photograph. Scale: 1"=500'	Panel #: 34078-H3, Clinton South, NC;/Flight Year: 2008	EDR


INQUIRY #: 3485672.4
YEAR: 1951
= 750'
N


INQUIRY #: 3485672.4
YEAR: 1958
= 750'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3485672.4
YEAR: 1981
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3485672.4
YEAR: 1993
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3485672.4
YEAR: 1998
= 750'
N


INQUIRY #: 3485672.4
YEAR: 2005
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3485672.4
YEAR: 2006
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3485672.4
YEAR: 2008
= 500'
N
EDR Environmental Data Resources Inc

Cedar Creek Mitigation Site
115 AIRPORT ROAD
Clinton, NC 28328

Inquiry Number: 3485672.6
January 02, 2013

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

1/02/13

Site Name:
Cedar Creek Mitigation Site
115 AIRPORT ROAD
Clinton, NC 28328

Client Name:
WK Dickson
720 Corporate Center Drive
Raleigh, NC 27607-0000

EDR Inquiry # 3485672.6

Contact: George Lankford

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by WK Dickson were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: Cedar Creek Mitigation Site
Address: 115 AIRPORT ROAD
City, State, Zip: Clinton, NC 28328
Cross Street:
P.O. # NA
Project: Cedar Creek Mitigation Site
Certification # 9B35-499F-ABDE

Sanborn® Library search results
Certification # 9B35-499F-ABDE

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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June 21, 2013

Mr. Martin Hovis
EBX
909 Capability Drive, Suite 3100
Raleigh, NC 27606

Subject: Categorical Exclusion
Cedar Creek Stream and Wetland Project
Cape Fear River Basin – CU# 03030006
Sampson County, North Carolina
Contract No. 005011, RFP No. 16-004365, EEP No. 95718

Dear Mr. Hovis:

Attached please find the approved Categorical Exclusion form for the subject full delivery project. Please include a copy of the approval form in your Mitigation Plan. I will recommend payment of your invoice in the amount of $95,500.00 for completion of the Task 1 deliverable upon receipt of an electronic version of the Categorical Exclusion document.

If you have any questions, or wish to discuss this matter further, please contact me at any time. I can be reached at (910) 796-7475, or email me at kristin.miguez@ncdenr.gov.

Sincerely,

Kristin E. Miguez, Project Manager

cc: Donnie Brew, FHWA
file

Appendix A

Categorical Exclusion Form for Ecosystem Enhancement Program Projects
Version 1.4

Note: Only Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Cedar Creek Mitigation Project
County Name:	Sampson
EEP Number:	
Project Sponsor:	Environmental Banc & Exchange, LLC
Project Contact Name:	Norton Webster
Project Contact Address:	909 Capability Drive, Suite 3100, Raleigh, NC 27606
Project Contact E-mail:	Norton@EBXUSA.com
EEP Project Manager:	

Project Description

The mitigation project at the Cedar Creek Site will involve restoration of the historic condition of coastal plain small stream swamps. Stream buffers throughout the project area will be restored and protected in perpetuity. Priority Level I restoration is proposed on four reaches. This will result in ecological improvements, including habitat restoration and a decrease in non-point source pollution from agricultural practices entering the Cedar Creek Site and the Great Coharie Creek

For Official Use Only

Reviewed By:

6-20-13
Date

Kelligra
EEP Project Manager

Conditional Approved By:

Date

For Division Administrator FHWA

☐ **Check this box if there are outstanding issues**

Final Approval By:

6-14-13
Date

For Division Administrator FHWA

USDA FORM AD-1006

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request January 17, 2013
Name of Project Cedar Creek Mitigation Site	Federal Agency Involved FHWA-EEP
Proposed Land Use Stream Mitigation Site	County and State Sampson County, NC
PART II *(To be completed by NRCS)*	Date Request Received By NRCS January 22, 2013 / Person Completing Form: Richard Brooks, RSS

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated: 0	Average Farm Size: 178
Major Crop(s): Corn	Farmable Land In Govt. Jurisdiction — Acres: 534789 % 86.8	Amount of Farmland As Defined in FPPA — Acres: 47220 % 76.6	
Name of Land Evaluation System Used: Sampson LE	Name of State or Local Site Assessment System: None	Date Land Evaluation Returned by NRCS: January 31, 2013	

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	10.36			
B. Total Acres To Be Converted Indirectly	22.63			
C. Total Acres In Site	32.99			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	4.65			
B. Total Acres Statewide Important or Local Important Farmland	2.44			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	.0015			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	86.8			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	16			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	4			
4. Protection Provided By State and Local Government	(20)	20			
5. Distance From Urban Built-up Area	(15)	15			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	10			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	79	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	16	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	79	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	95	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☑

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. State NFIP Engineer), NC Floodplain Mapping Unit (attn. State NFIP Coordinator) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	Cedar Creek Stream and Wetland Restoration Project
Name if stream or feature:	Unnamed Tributaries to Great Coharie Creek
County:	Sampson County, NC
Name of river basin:	Cape Fear River Basin
Is project urban or rural?	Rural
Name of Jurisdictional municipality/county:	Sampson
DFIRM panel number for entire site:	Firm Panel 1484 Map Number: 3720148400J Effective Date: January 5, 2007
Consultant name:	WK Dickson & Co., Inc. Daniel Ingram – Project Manager
Phone number:	(919)782-0495
Address:	720 Corporate Center Drive Raleigh, NC 27607

Design Information

Provide a general description of project (one paragraph). Include project limits on a reference orthophotograph at a scale of 1" = 500".

WK Dickson is designing the Cedar Creek Stream and Wetland Restoration Project in Sampson County, NC to provide stream mitigation units (SMUs) in the Cape Fear River Basin for the NC Ecosystem Enhancement Program (NCEEP). Stream restoration and enhancement activities include channel and floodplain grading and buffer improvements of approximately 8,207 linear feet of unnamed tributaries to Great Coharie Creek. Approximately 30 LF of minor floodplain/bank grading and buffer plantings are proposed for the portion of UT1 located within the Special Flood Hazard Area associated with Great Coharie Creek.

Project Component or Reach ID	Stationing/ Location	Mitigation Type	Total LF or AC	Priority
STREAM				
UT1	1+01 to 31+65	Enhancement II	3,064	Four
UT1	31+65 to 35+80	Enhancement I	415	Three
UT1	35+80 to 41+95	Enhancement II	615	Four
UT1	41+95 to 44+60	Enhancement I	265	Three
UT1	44+60 to 53+51	Enhancement II	827	Four
UT2	0+11 to 3+48	Headwater Valley Restoration	337	One
UT2	3+48 to 9+12	P1 Restoration	504	One
UT2-C	0+02 to 1+92	Headwater Valley Restoration	190	One
UT3	0+60 to 19+72	P1 Restoration	1,912	One
UT4	0+36 to 1+14	Enhancement II	78	Four
		TOTAL	**8,207**	
WETLAND				
W1	Adjacent to UT3 & UT1	Restoration	13.10	NA

Floodplain Information

Is project located in a Special Flood Hazard Area (SFHA)?

☉ Yes ○ No

If project is located in a SFHA, check how it was determined:

☐ Redelineation

☐ Detailed Study

☐ Limited Detail Study

☐ Approximate Study

☑ Don't know

List flood zone designation:

Check if applies:

☑ AE Zone

- ☐ Floodway
- ☐ Non-Encroachment
- ◉ None

☐ A Zone

- ☐ Local Setbacks Required
- ☐ No Local Setbacks Required

If local setbacks are required, list how many feet:

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?

☐ Yes ◉ No

Land Acquisition (Check)

☐ State owned (fee simple)

☐ Conservation easment (Design Bid Build)

☑ Conservation Easement (Full Delivery Project)

Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program?

◉ Yes ☐ No

Note: if community is not participating, then all requirements should be addressed to NFIP (attn: State NFIP Engineer, (919) 715-8000)

Name of Local Floodplain Administrator:
Phone Number:

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

☑ No Action

☐ No Rise

☐ Letter of Map Revision

☐ Conditional Letter of Map Revision

☐ Other Requirements

List other requirements:

Comments:

Name: _____ Signature: _____

Title: _____ Date: _____

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Pat McCrory, Governor
Susan W. Kluttz, Secretary
Kevin Cherry, Deputy Secretary

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

January 31, 2013

Daniel Ingram
W.K. Dickson & Company, Inc.
720 Corporate Center Drive
Raleigh, NC 27607

Re: Cedar Creek Stream and Wetland Mitigation Project, Sampson County, ER 13-0176

Dear Mr. Ingram:

Thank you for your letter of January 22, 2013, 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, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

United States Department of the Interior

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

March 8, 2013

Daniel Ingram
WK Dickson & Co., Inc.
720 Corporate Center Drive
Raleigh, NC 27607

Re: Cedar Creek Site EEP Full Delivery Stream & Wetland Mitigation- Sampson County, NC

Dear Mr. Temple:

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 concern[1] 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.

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

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

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

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

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

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

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

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

Sincerely,

Pete Benjamin
Field Supervisor

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

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

APPENDIX C

Mitigation Work Plan and Analyses

Cedar Creek Morphological Parameters
Cedar Creek Existing Conditions Profile Charts
Reference Reach Existing Profile Charts
HEC-RAS Output
Proposed Wetland Water Budget

Cedar Creek Morphological Parameters

	Reference Reach			Existing[1]										Design			
				UT1 (Upper)		UT1 (Lower)		UT2 A		UT3 A (Upper)	UT3 A (Lower)		UT4	UT2		UT3	
Feature	Pool	Run	Shallow	Shallow	Pool	Shallow	Pool	Shallow	Run	Run	Shallow	Run	Shallow	Shallow	Pool	Shallow	Pool
Drainage Area (ac)		81		2514		2780		34		116	150		79	41		146	
Drainage Area (mi^2)		0.13		3.93		4.34		0.05		0.18	0.23		0.12	0.06		0.23	
NC Regional Curve Discharge (cfs)[2]	---	---	3.7	44.3		47.7		2.0		4.8	5.8		3.7	2.3		6	
NC Regional Curve Discharge (cfs)[3]	---	---	1.8	24.9		26.8		0.9		2.4	2.9		1.8	1.1		3	
Design/Calculated Discharge (cfs)	---	---	5	---		---		---		---	---		---	4		6	
Dimension																	
BF Width (ft)	6.3	14.0	6.2	18.2	14.1	11.0	10.9	4.8	5.2	4.0	10.4	7.7	6.2	4.6	5.4	6.0	7.0
Floodprone Width (ft)	100.0	100.0	100.0	100	100	100	100	100	100	100	100	100	100	>50	>50	>50	>50
BF Cross Sectional Area (ft^2)	4.0	5.9	2.9	42.1	46.4	32.2	29.2	2.4	3.0	3.4	5.5	4.8	5.6	2.2	3.1	3.6	4.8
BF Mean Depth (ft)	0.6	0.4	0.5	2.3	3.3	2.9	2.7	0.5	0.6	0.9	0.5	0.6	0.9	0.5	0.6	0.6	0.7
BF Max Depth (ft)	1.0	0.5	0.8	3.2	4.4	3.7	3.3	0.7	0.9	1.0	0.8	1.1	1.3	0.7	1.0	0.8	1.2
Width/Depth Ratio	10.2	33.3	13.4	7.9	4.3	3.8	4.1	9.6	10.5	4.7	19.7	12.2	6.9	10.2	9.4	10.2	10.1
Entrenchment Ratio	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2	>2.2
Wetted Perimeter (ft)	7.1	14.2	6.7	20.4	18.8	15.8	16.2	5.2	5.9	5.8	10.7	8.2	7.1	4.9	5.9	6.4	7.6
Hydraulic Radius (ft)	0.6	0.4	0.4	2.1	2.5	2.0	1.8	0.5	0.5	0.6	0.5	0.6	0.8	0.4	0.5	0.6	0.6
Substrate																	
	Medium/Coarse Sand			Medium/Coarse Sand										Medium/Coarse Sand			
Pattern																	
	Min	**Max**	**Med**	---		---		---		---	---		---	**Min**	**Max**	**Min**	**Max**
Channel Beltwidth (ft)	13.0	19.3	13.9	---		---		---		---	---		---	10.5	15.7	12.6	18.8
Radius of Curvature (ft)	5.2	11.7	9.9	---		---		---		---	---		---	4.2	9.4	5.1	11.3
Radius of Curvature Ratio	0.7	1.6	1.3	---		---		---		---	---		---	1.0	3.0	1.0	3.0
Meander Wavelength (ft)	13.3	22.5	21.1	---		---		---		---	---		---	4.6	13.8	6.0	18.0
Meander Width Ratio	2.1	3.1	2.2	---		---		---		---	---		---	2.1	3.1	2.1	3.1
Profile																	
Shallow Length (ft)	2.0	30.9	10.9	---		---		---		---	---		---	2	24	2	29
Run Length (ft)	1.0	20.1	6.9	---		---		---		---	---		---	1	16	1	19
Pool Length (ft)	2.6	12.1	5.8	---		---		---		---	---		---	2	10	2	11
Pool -to-Pool Spacing (ft)	10.1	61.0	28.6	---		---		---		---	---		---	8	48	10	58
Additional Reach Parameters																	
Valley Length (ft)		164		3376		1515		255		486	731		78	643		1600	
Channel Length (ft)		203		3694		1574		275		496	739		78	724		1912	
Sinuosity		1.24		1.09		1.04		1.08		1.02	1.01		1.00	1.13		1.20	
Water Surface Slope (ft/ft)		0.009		---		---		---		---	---		---	---		---	
Channel Slope (ft/ft)		0.009		0.0022		0.0016		0.012		0.0164	0.007		0.010	0.0170		0.0095	
Rosgen Classification		E/C5		E5		E5		E5		E5	E5		E5	E5		E5	

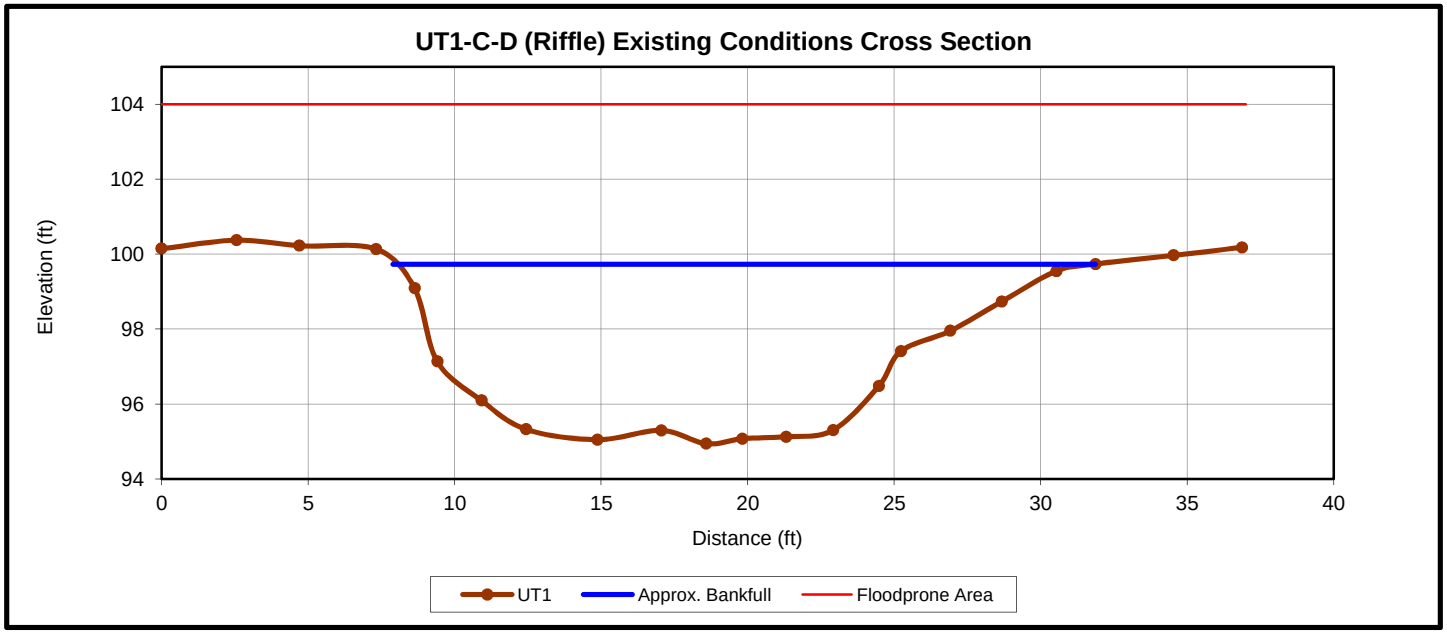
[1] Bankfull stage was estimated using NC Regional Curve equations and existing conditions data

[2] NC Regional Curve equations source: Doll et al. (2003)

[3] NC Regional Curve equations source: Sweet and Geratz (2003)

Upstream

Downstream



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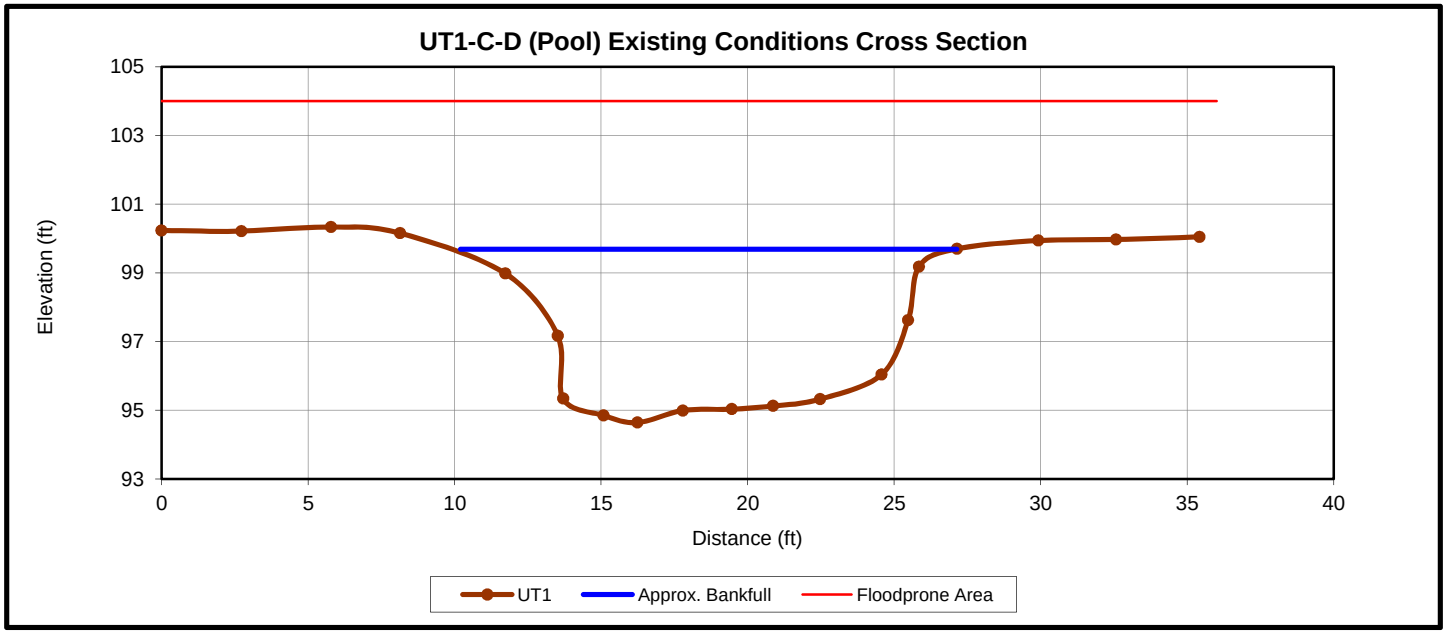

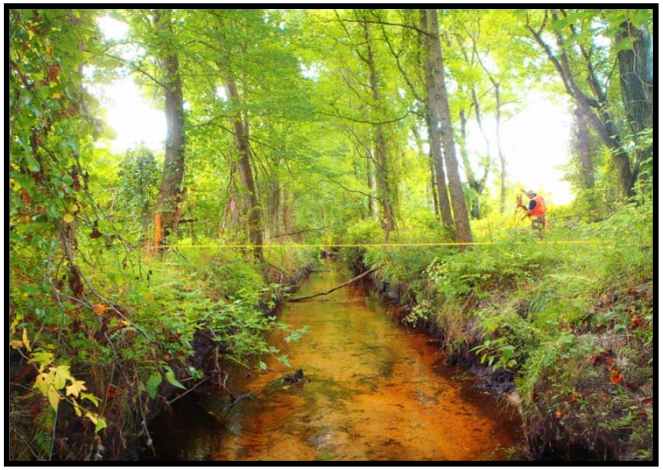

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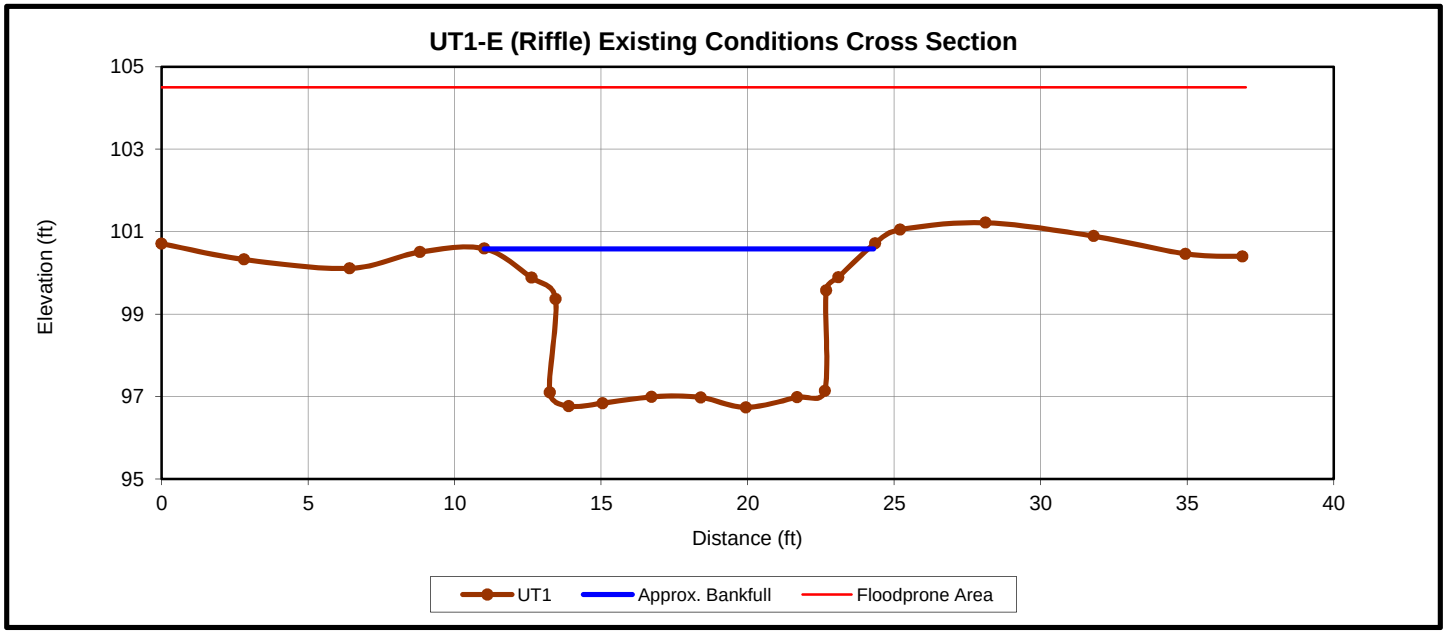

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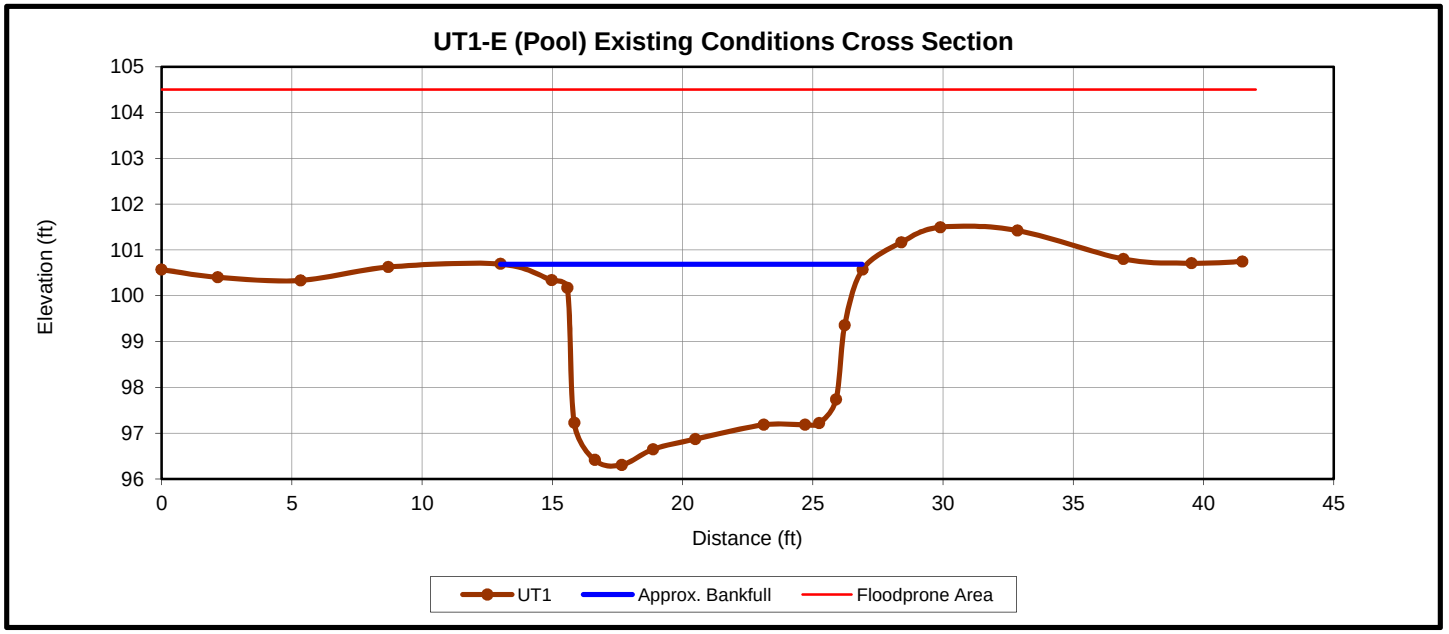

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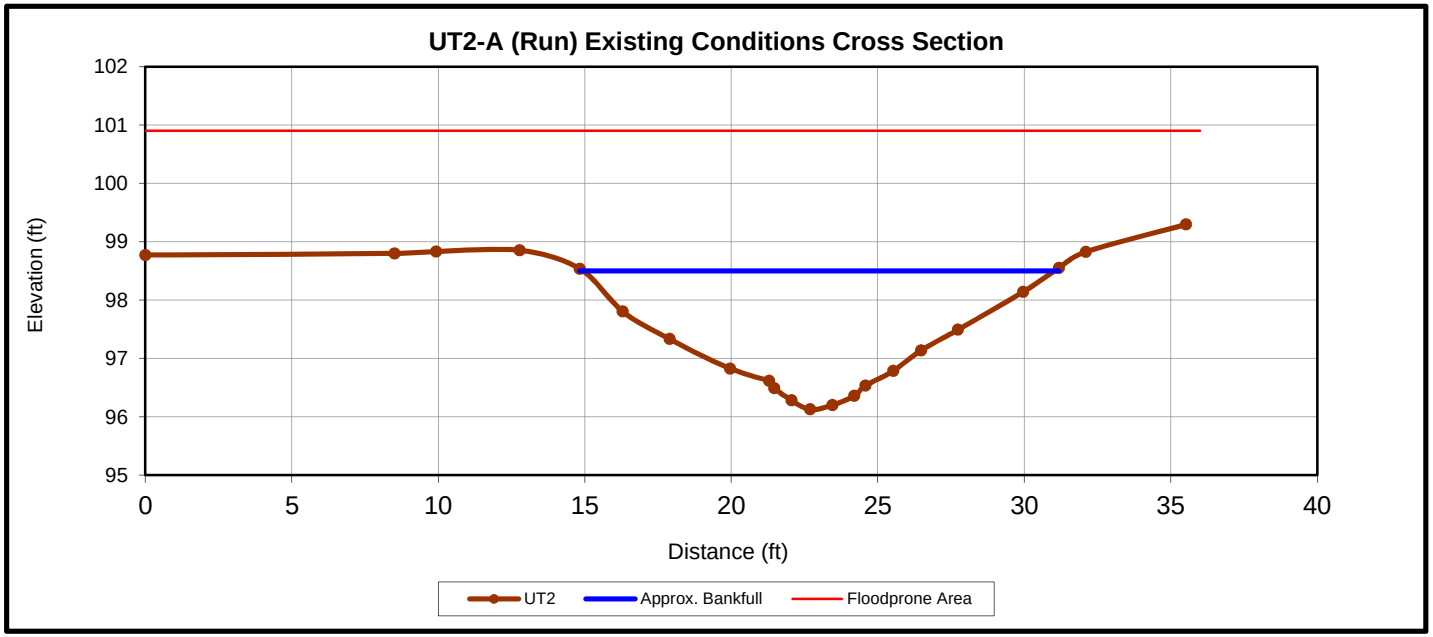
Downstream



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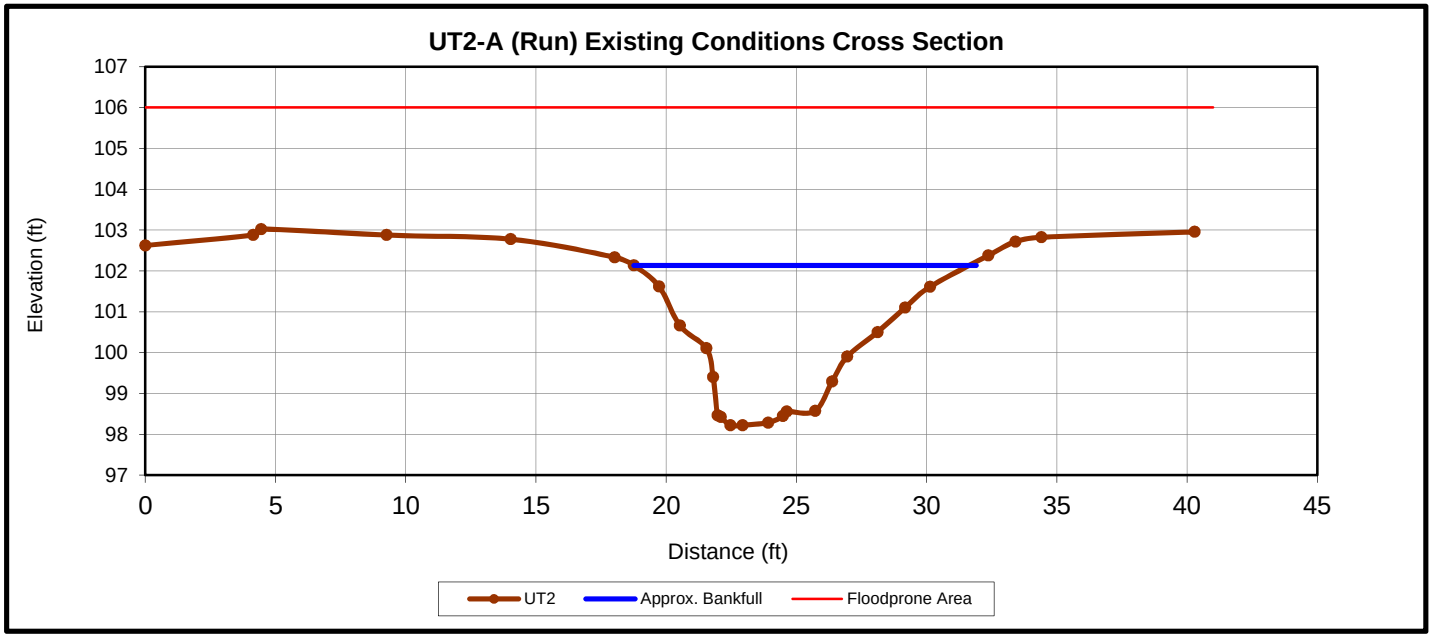
Downstream



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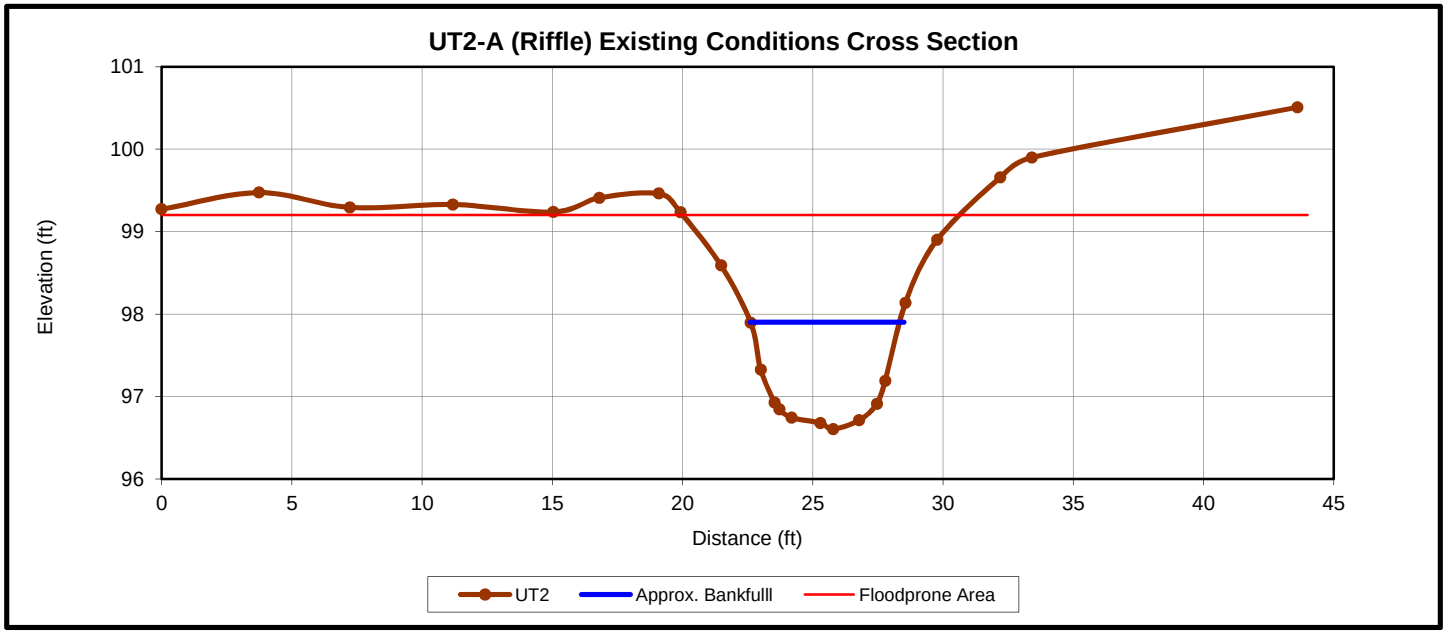

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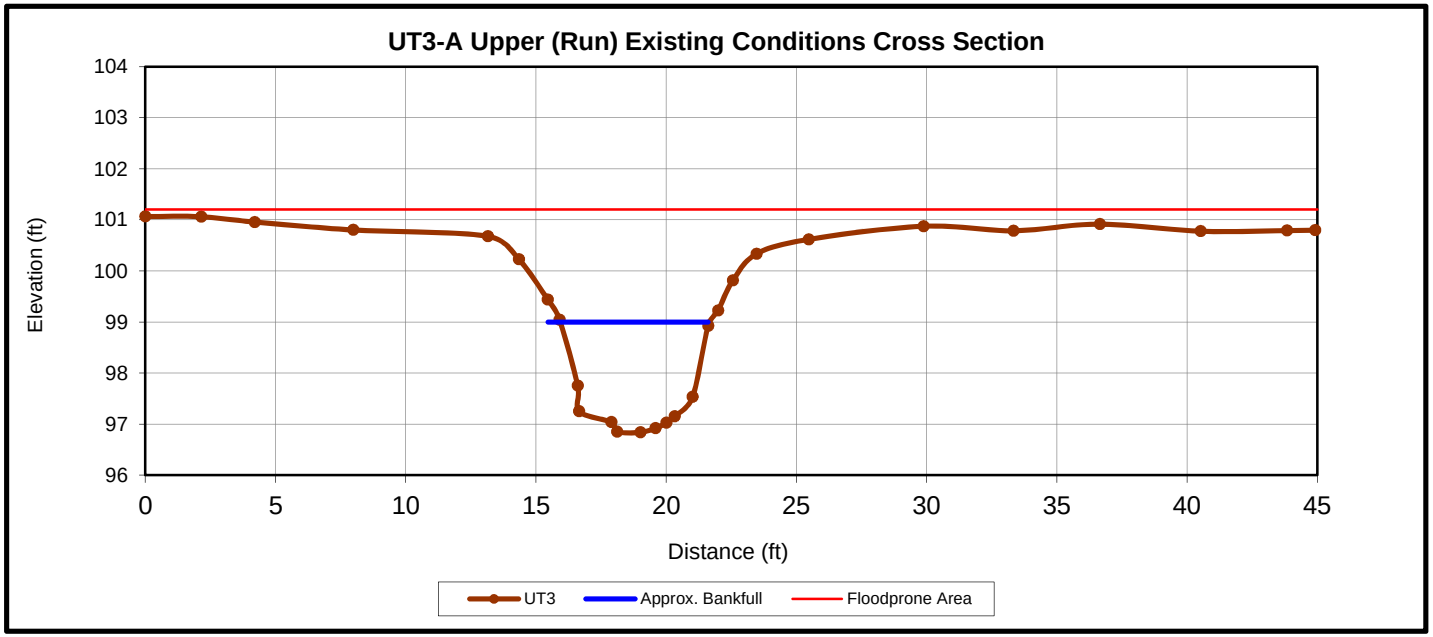

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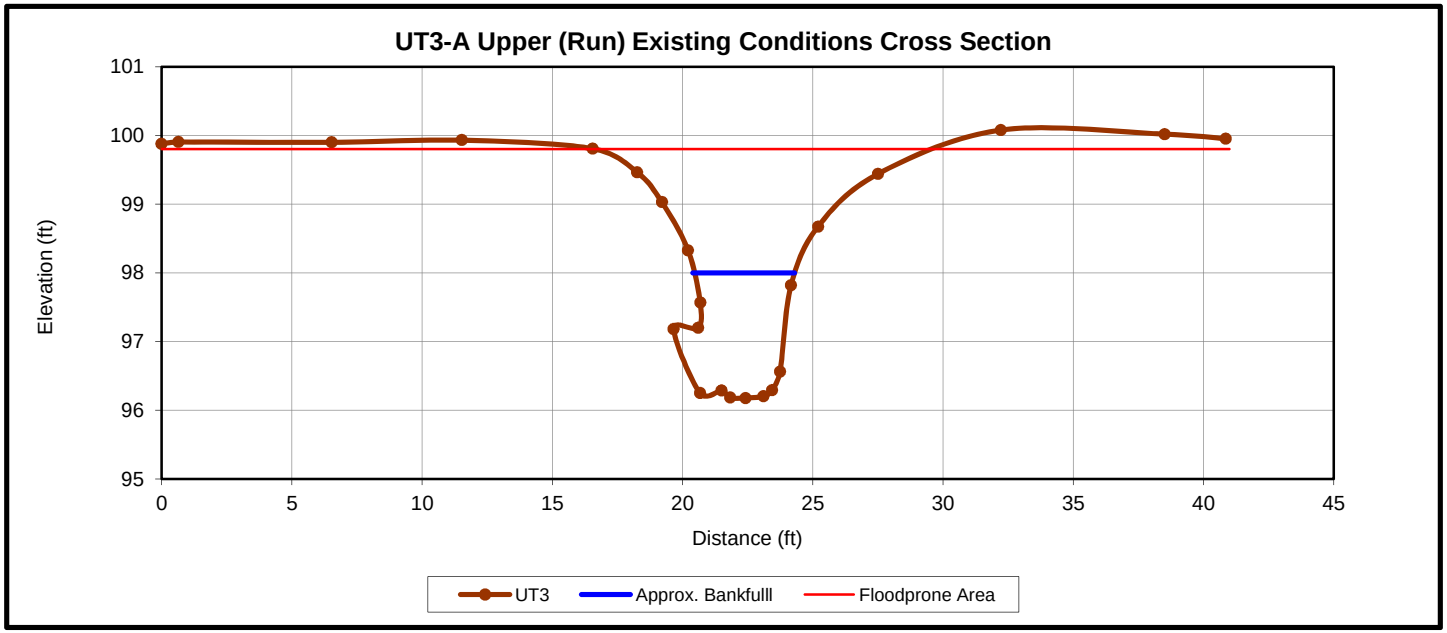

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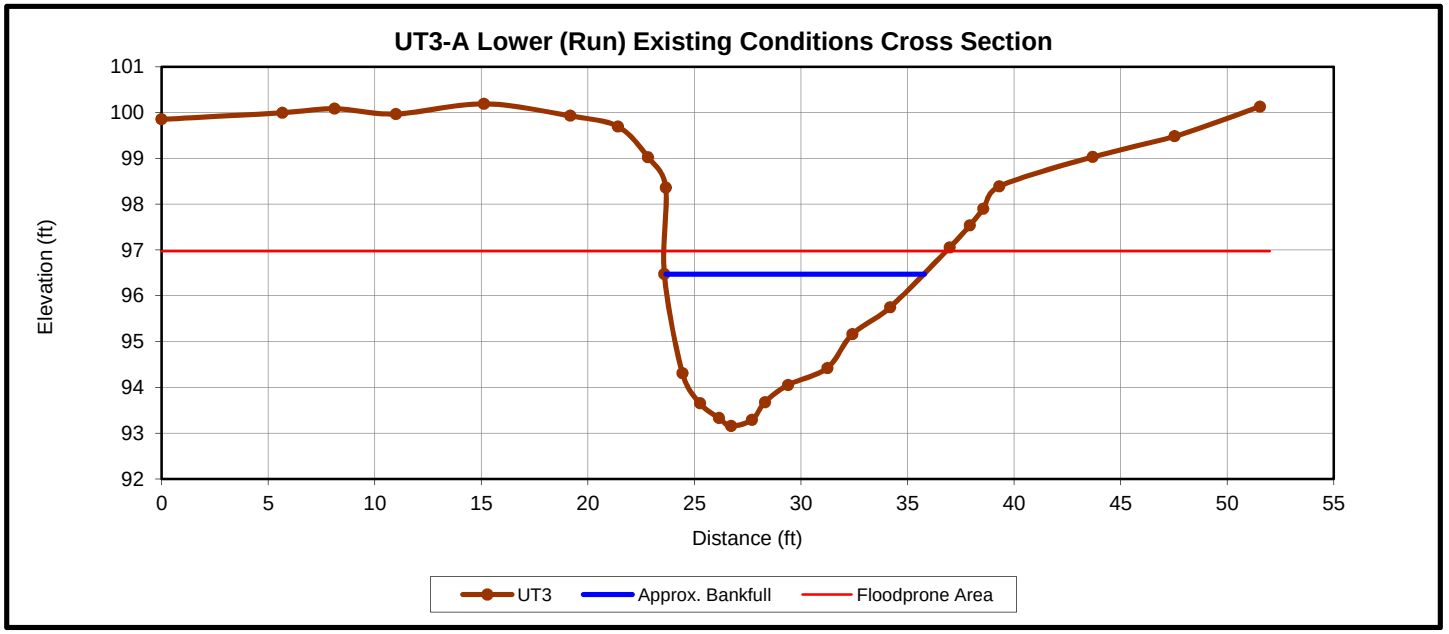

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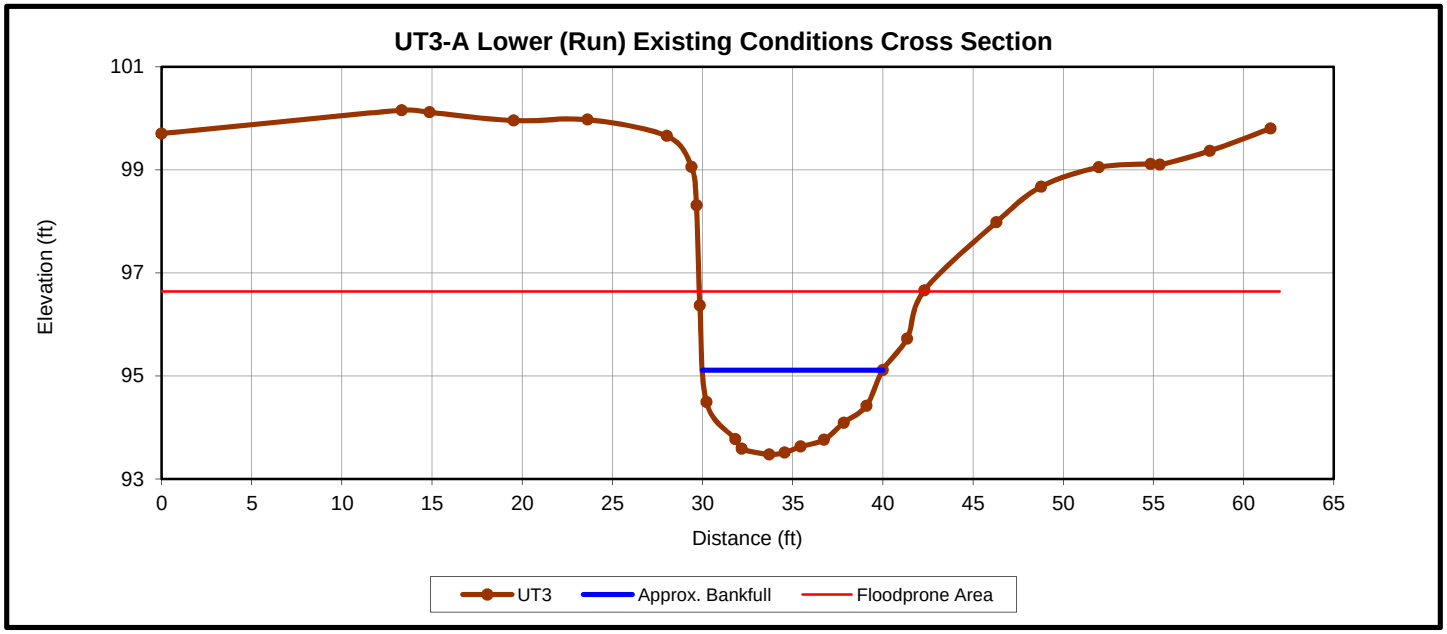
Downstream



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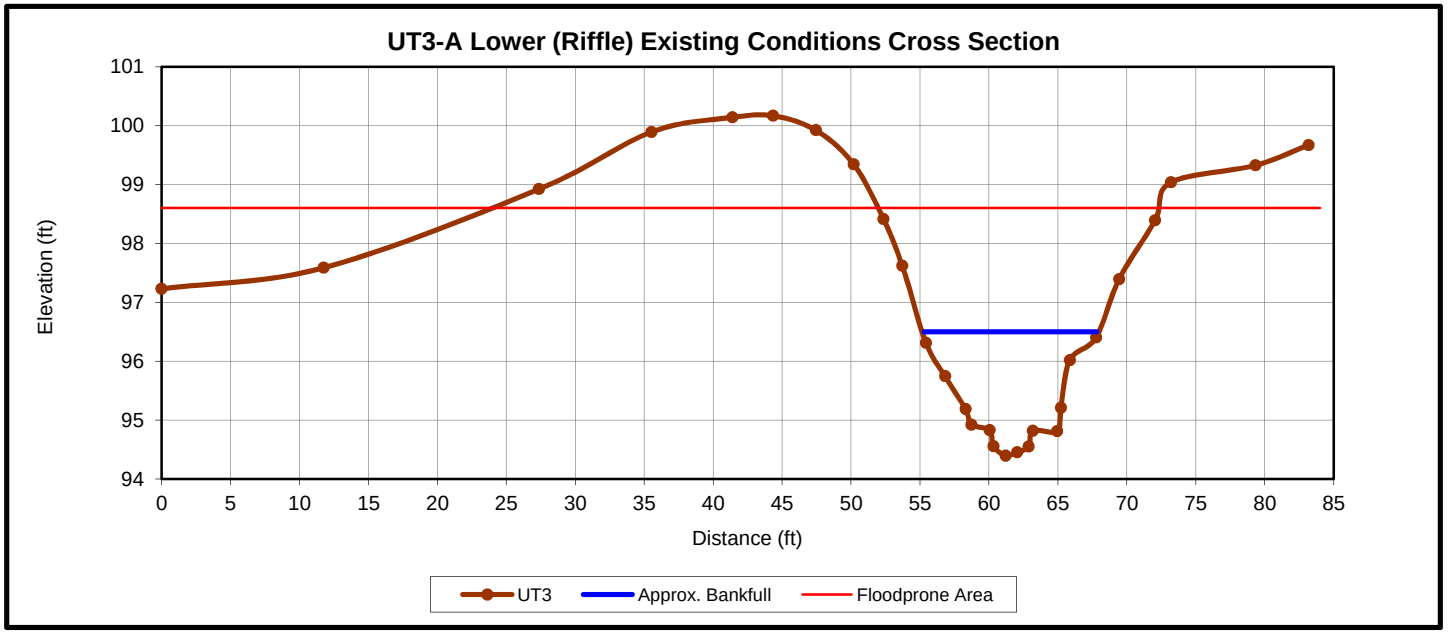

Upstream

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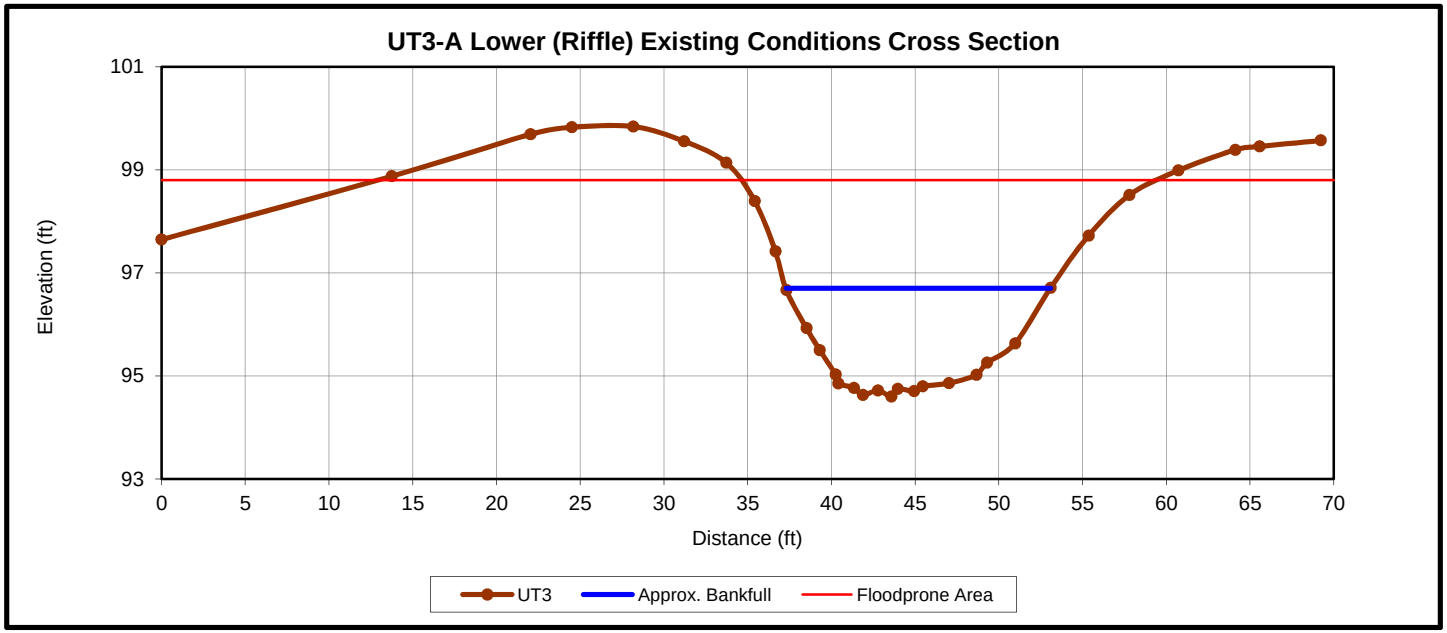
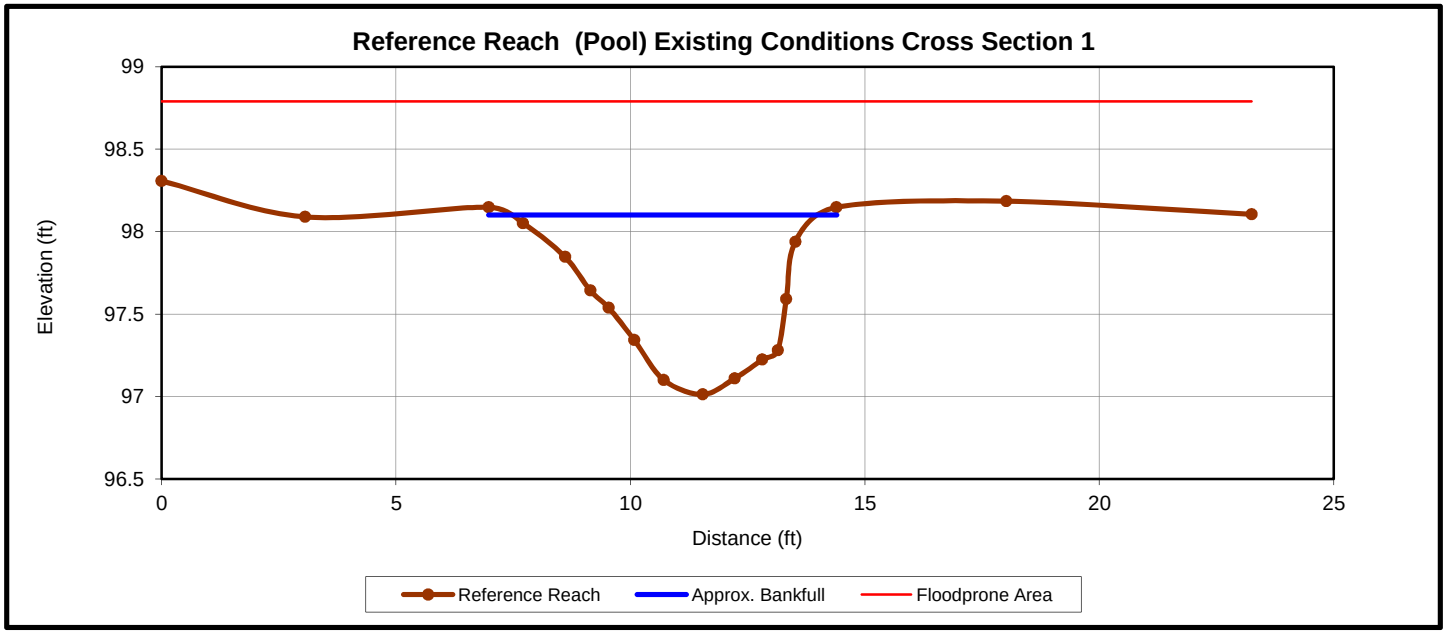


Upstream

Downstream



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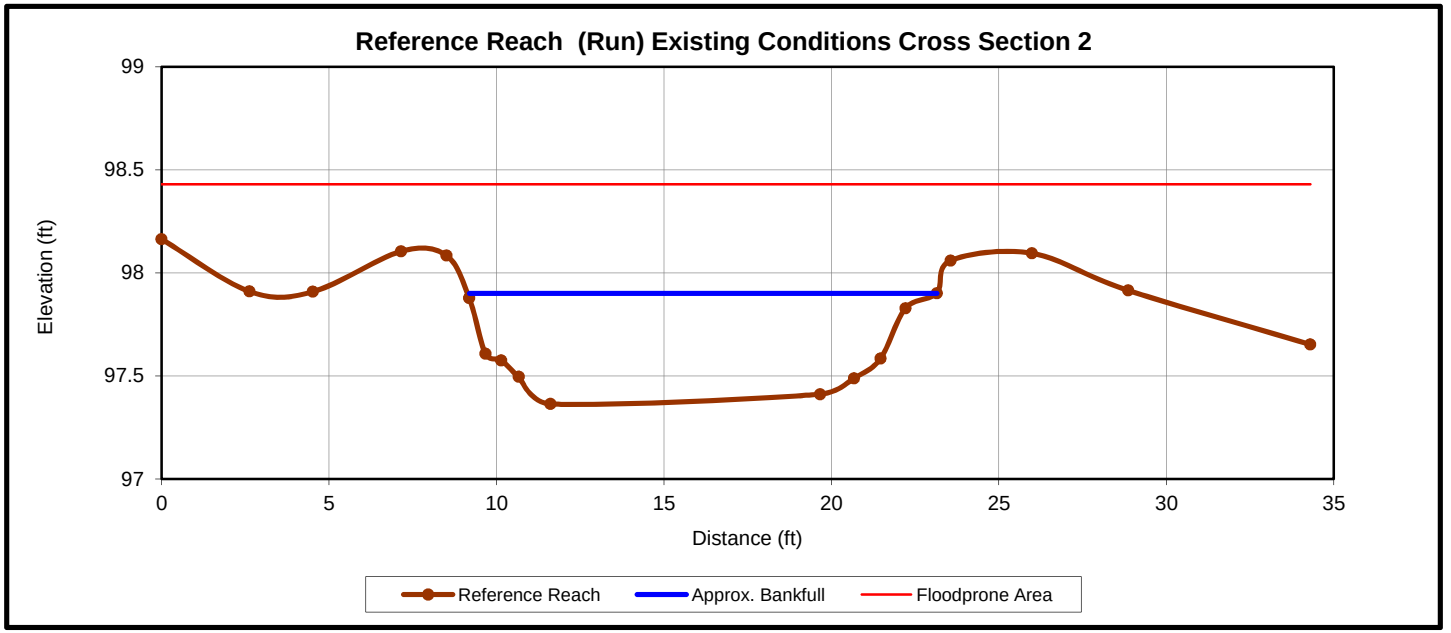

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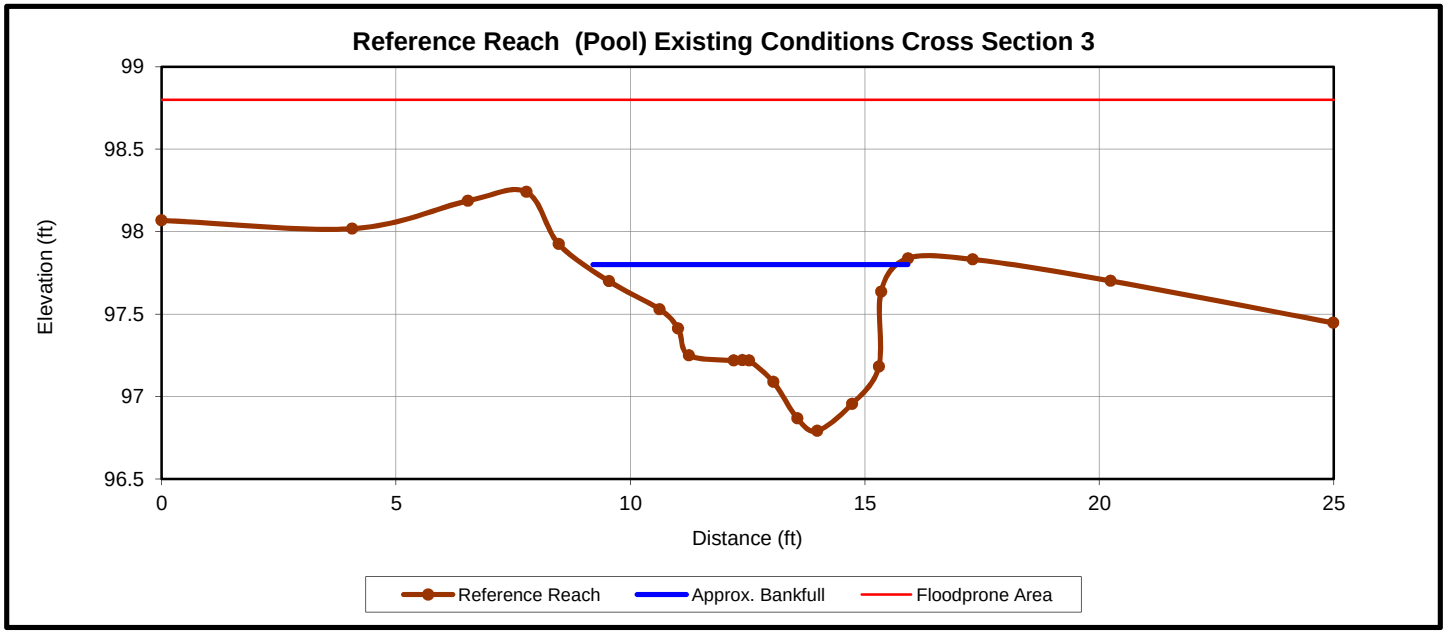

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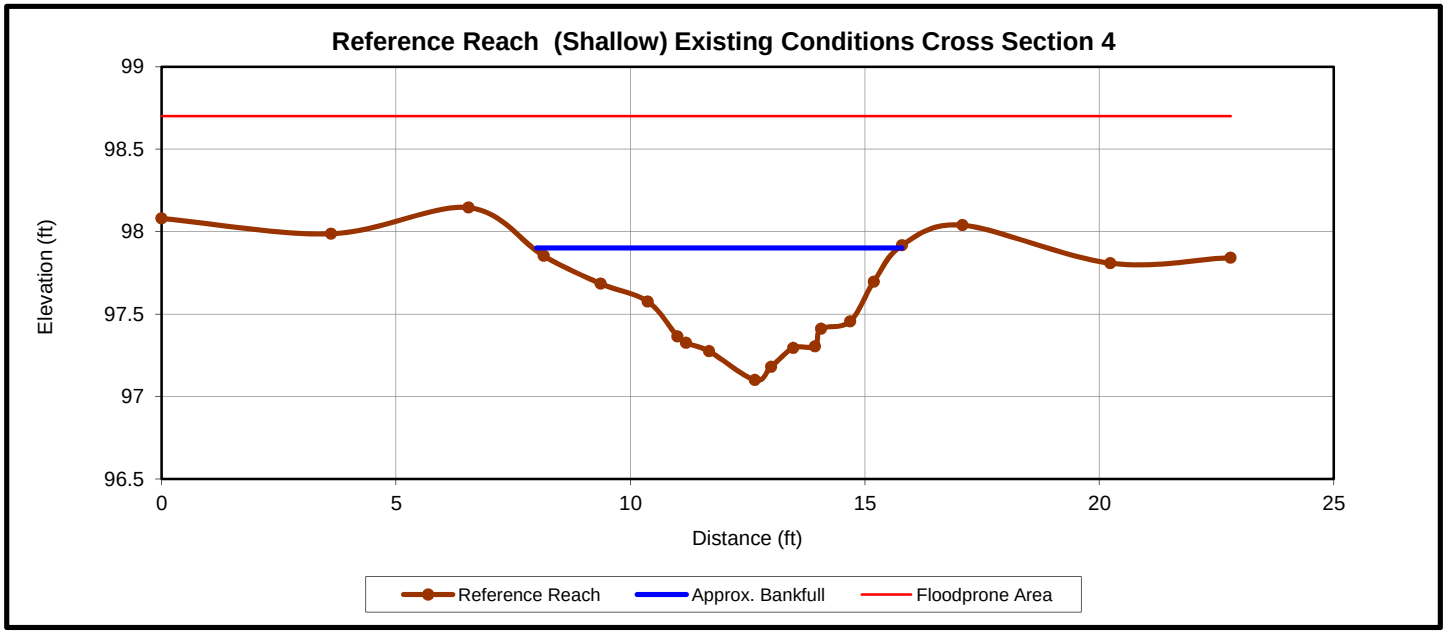

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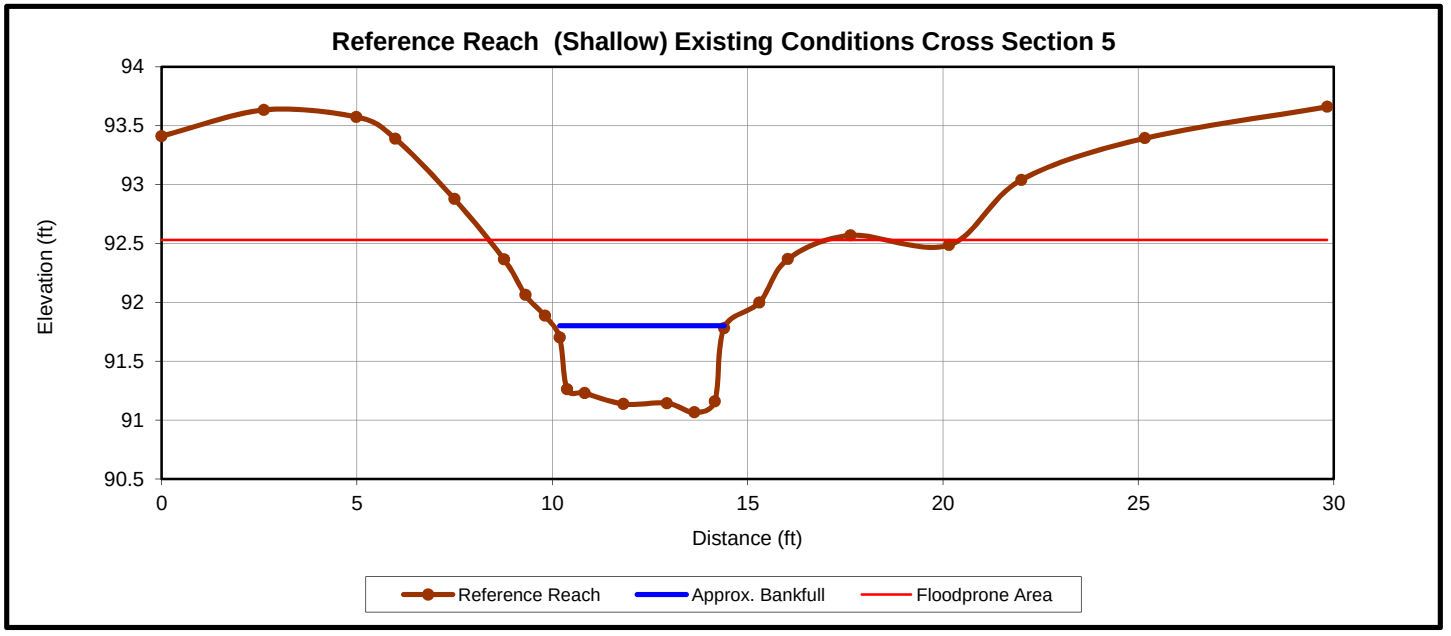


Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Power Total (lb/ft s)	Shear Chan (lb/sq ft)
PROP UT2	800	DesignQ	4	106.23	106.75		106.87	0.046125	2.86	1.4	3.83	2.84	0.99
PROP UT2	800	Q1.1	2	106.23	106.59		106.68	0.044325	2.32	0.86	3.16	1.66	0.72
PROP UT2	800	Q1.5	3	106.23	106.68		106.78	0.045976	2.63	1.14	3.52	2.32	0.88
PROP UT2	800	Q2	8	106.23	106.95		107.14	0.04674	3.5	2.29	4.76	4.59	1.35
PROP UT2	800	Q10	25	106.23	107.45	107.45	107.86	0.042269	5.27	5.37	7.77	8	2.44
PROP UT2	790	DesignQ	4	105.83	106.41		106.5	0.028958	2.41	1.66	4.11	1.66	0.69
PROP UT2	790	Q1.1	2	105.83	106.22		106.29	0.033605	2.1	0.95	3.28	1.21	0.58
PROP UT2	790	Q1.5	3	105.83	106.33		106.41	0.030317	2.27	1.32	3.74	1.43	0.63
PROP UT2	790	Q2	8	105.83	106.64		106.78	0.026849	2.96	2.74	5.31	2.37	0.92
PROP UT2	790	Q10	25	105.83	107.24		107.51	0.021631	4.26	7.04	8.99	3.54	1.5
PROP UT2	750	DesignQ	4	105.02	105.75		105.8	0.011209	1.74	2.31	4.82	0.54	0.33
PROP UT2	750	Q1.1	2	105.02	105.55		105.58	0.010751	1.4	1.43	3.83	0.33	0.24
PROP UT2	750	Q1.5	3	105.02	105.66		105.7	0.01123	1.58	1.89	4.31	0.46	0.29
PROP UT2	750	Q2	8	105.02	106		106.08	0.011519	2.3	3.75	7.73	0.71	0.51
PROP UT2	750	Q10	25	105.02	106.48		106.7	0.018384	4.02	7.72	9.01	2.94	1.32
PROP UT2	700	DesignQ	4	104.13	104.65		104.77	0.046864	2.88	1.39	3.78	2.92	1.01
PROP UT2	700	Q1.1	2	104.13	104.48		104.57	0.050068	2.43	0.82	3.09	1.93	0.79
PROP UT2	700	Q1.5	3	104.13	104.57		104.68	0.04673	2.66	1.13	3.48	2.38	0.9
PROP UT2	700	Q2	8	104.13	104.86	104.81	105.05	0.044464	3.46	2.32	5.41	3.88	1.32
PROP UT2	700	Q10	25	104.13	105.38	105.38	105.61	0.026416	4.27	9.92	25.7	1.58	1.58
PROP UT2	690	DesignQ	4	103.73	104.32		104.41	0.027828	2.38	1.68	4.09	1.6	0.67
PROP UT2	690	Q1.1	2	103.73	104.14		104.2	0.027054	1.95	1.03	3.35	0.95	0.49
PROP UT2	690	Q1.5	3	103.73	104.23		104.31	0.029269	2.24	1.34	3.72	1.39	0.62
PROP UT2	690	Q2	8	103.73	104.53		104.67	0.030024	3.07	2.71	6.96	2.06	1
PROP UT2	690	Q10	25	103.73	104.98	104.98	105.21	0.026413	4.27	9.92	25.7	1.58	1.58
PROP UT2	650	DesignQ	4	102.92	103.64		103.69	0.011932	1.77	2.27	5.04	0.56	0.35
PROP UT2	650	Q1.1	2	102.92	103.42		103.45	0.013422	1.51	1.32	3.71	0.43	0.28
PROP UT2	650	Q1.5	3	102.92	103.55		103.59	0.011796	1.61	1.86	4.28	0.48	0.3
PROP UT2	650	Q2	8	102.92	103.89		103.97	0.010853	2.21	4.77	17.81	0.3	0.47
PROP UT2	650	Q10	25	102.92	104.24		104.37	0.015856	3.45	14.31	35.75	0.68	1.01
PROP UT2	600	DesignQ	4	102.02	102.55		102.67	0.042443	2.78	1.44	3.84	2.6	0.94
PROP UT2	600	Q1.1	2	102.02	102.42		102.49	0.029827	2.02	0.99	3.31	1.07	0.53
PROP UT2	600	Q1.5	3	102.02	102.48		102.58	0.042016	2.56	1.17	3.53	2.11	0.82
PROP UT2	600	Q2	8	102.02	102.73	102.71	102.93	0.051414	3.62	2.27	10.35	2.41	1.46
PROP UT2	600	Q10	25	102.02	103.13	103.13	103.31	0.030359	4.13	11.72	32.7	1.43	1.56
PROP UT2	590	DesignQ	4	101.62	102.18		102.28	0.034935	2.59	1.54	3.95	2.08	0.8
PROP UT2	590	Q1.1	2	101.62	101.95	101.93	102.06	0.061832	2.61	0.77	3.01	2.45	0.94
PROP UT2	590	Q1.5	3	101.62	102.1		102.19	0.03617	2.42	1.24	3.61	1.77	0.73
PROP UT2	590	Q2	8	101.62	102.42	102.31	102.54	0.027359	2.94	3.49	17.53	0.77	0.91
PROP UT2	590	Q10	25	101.62	102.79	102.73	102.92	0.021371	3.62	13.7	34.36	0.96	1.17
PROP UT2	550	DesignQ	4	100.62	101.3		101.36	0.015864	1.94	2.1	5.27	0.71	0.43
PROP UT2	550	Q1.1	2	100.62	101.15		101.18	0.010902	1.4	1.42	3.82	0.34	0.24
PROP UT2	550	Q1.5	3	100.62	101.21		101.26	0.015814	1.8	1.67	4.15	0.67	0.38
PROP UT2	550	Q2	8	100.62	101.47	101.31	101.58	0.020671	2.72	3.36	9.39	1.05	0.76
PROP UT2	550	Q10	25	100.62	101.9	101.84	102.07	0.0207	3.84	11.24	24	1.32	1.27
PROP UT2	510	DesignQ	4	99.82	100.3	100.3	100.38	0.041874	2.61	2.52	18.56	0.56	0.85
PROP UT2	510	Q1.1	2	99.82	100.14	100.14	100.26	0.074732	2.79	0.72	2.93	3.03	1.09
PROP UT2	510	Q1.5	3	99.82	100.27	100.27	100.34	0.035909	2.33	1.97	17.54	0.38	0.69
PROP UT2	510	Q2	8	99.82	100.42	100.42	100.49	0.035731	2.73	5.74	29.45	0.6	0.87
PROP UT2	510	Q10	25	99.82	100.59	100.59	100.74	0.059756	4.22	11.06	31.7	2.9	1.91
PROP UT2	500	DesignQ	4	99.42	99.98		100.01	0.01502	1.71	4.57	28.88	0.13	0.35
PROP UT2	500	Q1.1	2	99.42	99.85	99.74	99.89	0.019881	1.7	1.7	17.02	0.14	0.37
PROP UT2	500	Q1.5	3	99.42	99.93		99.96	0.016527	1.7	3.12	22.24	0.14	0.35
PROP UT2	500	Q2	8	99.42	100.12		100.14	0.012678	1.76	8.6	30.78	0.2	0.35
PROP UT2	500	Q10	25	99.42	100.46		100.5	0.010344	2.29	19.73	33.14	0.48	0.49
PROP UT2	450	DesignQ	4	98.52	99.2		99.26	0.015272	1.91	2.15	6.7	0.54	0.41

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Power Total (lb/ft s)	Shear Chan (lb/sq ft)
PROP UT2	450	Q1.1	2	98.52	99		99.04	0.014975	1.57	1.27	3.65	0.48	0.31
PROP UT2	450	Q1.5	3	98.52	99.11		99.16	0.015203	1.77	1.7	4.11	0.65	0.37
PROP UT2	450	Q2	8	98.52	99.41		99.48	0.01398	2.32	5.01	17.7	0.38	0.54
PROP UT2	450	Q10	25	98.52	99.88		99.97	0.01125	2.98	14.11	20.52	0.83	0.74
PROP UT2	400	DesignQ	4	97.62	98.23	98.09	98.31	0.024085	2.26	1.77	4.18	1.35	0.6
PROP UT2	400	Q1.1	2	97.62	98.05	97.93	98.1	0.024224	1.87	1.07	3.41	0.84	0.45
PROP UT2	400	Q1.5	3	97.62	98.15	98.02	98.21	0.024528	2.11	1.42	3.82	1.13	0.54
PROP UT2	400	Q2	8	97.62	98.46	98.3	98.58	0.023868	2.87	2.89	6.46	1.75	0.85
PROP UT2	400	Q10	25	97.62	98.9	98.9	99.14	0.025911	4.3	9.67	25.84	1.52	1.59
PROP UT2	350	DesignQ	4	95.85	96.29	96.29	96.43	0.065556	3.14	1.53	5.76	2.64	1.25
PROP UT2	350	Q1.1	2	95.85	96.18	96.18	96.27	0.060571	2.56	0.9	5.08	1.42	0.9
PROP UT2	350	Q1.5	3	95.85	96.24	96.24	96.36	0.061369	2.85	1.25	5.47	1.97	1.07
PROP UT2	350	Q2	8	95.85	96.45	96.45	96.65	0.070715	3.85	2.56	8.38	3.88	1.73
PROP UT2	350	Q10	25	95.85	96.78	96.78	96.94	0.043102	4.24	11.85	35.78	1.82	1.77
PROP UT2	300	DesignQ	4	94.15	94.9	94.62	94.94	0.009907	1.67	2.44	7.93	0.3	0.3
PROP UT2	300	Q1.1	2	94.15	94.7	94.47	94.72	0.009329	1.33	1.51	3.91	0.28	0.21
PROP UT2	300	Q1.5	3	94.15	94.81	94.55	94.85	0.009693	1.5	2	4.41	0.39	0.26
PROP UT2	300	Q2	8	94.15	95.11	94.83	95.17	0.009192	2.02	6.4	24.74	0.18	0.39
PROP UT2	300	Q10	25	94.15	95.52		95.58	0.008697	2.63	18.73	33.55	0.4	0.58
PROP UT2	250	DesignQ	4	93.25	93.72	93.72	93.89	0.068889	3.31	1.21	3.57	4.55	1.37
PROP UT2	250	Q1.1	2	93.25	93.56	93.56	93.69	0.076081	2.81	0.71	2.93	3.09	1.1
PROP UT2	250	Q1.5	3	93.25	93.65	93.65	93.8	0.0712	3.09	0.97	3.28	3.85	1.25
PROP UT2	250	Q2	8	93.25	93.92	93.92	94.16	0.066618	3.95	2.02	4.43	7.03	1.78
PROP UT2	250	Q10	25	93.25	94.45	94.45	94.76	0.036682	4.84	7.12	15.23	3.64	2.07
PROP UT2	210	DesignQ	4	91.35	92.04		92.06	0.006851	1.29	4.4	11.81	0.14	0.19
PROP UT2	210	Q1.1	2	91.35	91.9		91.91	0.005467	1.02	2.79	10.48	0.06	0.12
PROP UT2	210	Q1.5	3	91.35	91.98		92	0.006196	1.17	3.66	11.23	0.1	0.16
PROP UT2	210	Q2	8	91.35	92.24		92.27	0.007453	1.69	7.27	17.81	0.2	0.29
PROP UT2	210	Q10	25	91.35	92.69		92.75	0.008529	2.56	18.45	31.98	0.4	0.55
PROP UT2	200	DesignQ	4	91.35	91.9		91.95	0.021157	2.01	2.82	10.52	0.48	0.48
PROP UT2	200	Q1.1	2	91.35	91.76	91.68	91.81	0.025114	1.85	1.38	9.02	0.34	0.45
PROP UT2	200	Q1.5	3	91.35	91.83	91.77	91.88	0.023152	1.96	2.13	9.89	0.42	0.48
PROP UT2	200	Q2	8	91.35	92.09		92.15	0.019388	2.31	4.98	13.14	0.7	0.58
PROP UT2	200	Q10	25	91.35	92.52		92.62	0.017178	3.26	13.58	26.74	0.96	0.95
PROP UT2	150	DesignQ	4	90.45	91.16		91.2	0.011263	1.69	2.77	7.58	0.34	0.32
PROP UT2	150	Q1.1	2	90.45	90.97		91	0.011063	1.41	1.52	5.71	0.23	0.24
PROP UT2	150	Q1.5	3	90.45	91.08		91.11	0.011019	1.55	2.19	6.74	0.29	0.28
PROP UT2	150	Q2	8	90.45	91.39		91.45	0.010711	2.13	5.04	12.32	0.41	0.44
PROP UT2	150	Q10	25	90.45	91.8		91.9	0.012532	3.12	16.86	43.5	0.43	0.82
PROP UT2	100	DesignQ	4	89.55	90.07		90.2	0.044773	2.83	1.41	3.81	2.77	0.98
PROP UT2	100	Q1.1	2	89.55	89.91		90	0.046877	2.37	0.84	3.11	1.79	0.75
PROP UT2	100	Q1.5	3	89.55	90		90.1	0.046129	2.64	1.13	3.49	2.34	0.89
PROP UT2	100	Q2	8	89.55	90.28	90.23	90.47	0.045237	3.48	2.32	6.04	3.54	1.33
PROP UT2	100	Q10	25	89.55	90.75	90.75	90.97	0.029071	4.32	10.35	28.3	1.56	1.65
PROP UT2	50	DesignQ	4	88.15	88.82	88.62	88.88	0.017007	1.99	2.01	4.42	0.9	0.45
PROP UT2	50	Q1.1	2	88.15	88.62	88.47	88.66	0.017023	1.65	1.21	3.58	0.56	0.34
PROP UT2	50	Q1.5	3	88.15	88.73	88.55	88.78	0.017016	1.84	1.63	4.04	0.74	0.4
PROP UT2	50	Q2	8	88.15	89.03	88.83	89.13	0.017001	2.54	3.76	10.33	0.79	0.65
PROP UT2	50	Q10	25	88.15	89.52	89.32	89.69	0.017007	3.69	10.23	16	1.61	1.14

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Power Total (lb/ft s)	Shear Chan (lb/sq ft)
UT3 PROP	1900	DesignQ	6	107.48	108.17		108.23	0.011897	2.04	2.94	5.52	0.76	0.37
UT3 PROP	1900	Q1.1	7	107.48	108.24		108.31	0.01113	2.09	3.35	5.79	0.79	0.38
UT3 PROP	1900	Q1.5	11	107.48	108.41		108.51	0.012214	2.54	4.48	8.57	0.93	0.52
UT3 PROP	1900	Q2	15	107.48	108.51		108.64	0.014403	3.01	5.44	10.54	1.23	0.7
UT3 PROP	1900	Q10	86	107.48	109.49	109.49	109.84	0.018048	5.67	30.92	53.62	1.77	1.91
UT3 PROP	1800	DesignQ	6	106.52	107.21	106.99	107.25	0.008237	1.7	5.21	20.55	0.15	0.26
UT3 PROP	1800	Q1.1	7	106.52	107.24	107.02	107.28	0.009335	1.85	5.76	22.06	0.18	0.3
UT3 PROP	1800	Q1.5	11	106.52	107.37	107.19	107.42	0.009304	2.07	9.67	40.86	0.15	0.36
UT3 PROP	1800	Q2	15	106.52	107.46	107.28	107.51	0.008905	2.19	13.42	48.99	0.17	0.38
UT3 PROP	1800	Q10	86	106.52	108.05		108.12	0.008679	3.21	58.14	80	0.57	0.68
UT3 PROP	1700	DesignQ	6	105.07	105.56	105.56	105.7	0.037861	3.03	2.33	14.71	0.95	0.9
UT3 PROP	1700	Q1.1	7	105.07	105.62	105.62	105.74	0.029598	2.85	3.41	19.41	0.66	0.77
UT3 PROP	1700	Q1.5	11	105.07	105.72	105.72	105.85	0.031852	3.22	5.38	22.9	0.94	0.94
UT3 PROP	1700	Q2	15	105.07	105.78	105.78	105.93	0.034097	3.52	7.04	25.46	1.24	1.09
UT3 PROP	1700	Q10	86	105.07	106.43	106.33	106.65	0.02857	5.33	36.14	80	1.89	1.95
UT3 PROP	1600	DesignQ	6	103.59	104.37		104.4	0.006271	1.58	5.61	31.3	0.07	0.22
UT3 PROP	1600	Q1.1	7	103.59	104.41		104.44	0.006052	1.61	7.15	41.19	0.06	0.22
UT3 PROP	1600	Q1.5	11	103.59	104.54		104.57	0.00496	1.65	14.04	59.89	0.06	0.22
UT3 PROP	1600	Q2	15	103.59	104.6		104.63	0.005674	1.86	17.68	62.73	0.08	0.27
UT3 PROP	1600	Q10	86	103.59	105.19		105.26	0.007787	3.15	58.97	74.92	0.55	0.64
UT3 PROP	1500	DesignQ	6	102.61	103.17		103.28	0.024917	2.64	2.27	5.1	1.73	0.66
UT3 PROP	1500	Q1.1	7	102.61	103.21		103.34	0.025872	2.8	2.5	5.27	2.03	0.72
UT3 PROP	1500	Q1.5	11	102.61	103.34	103.26	103.53	0.031417	3.43	3.21	5.75	3.53	1.03
UT3 PROP	1500	Q2	15	102.61	103.54	103.46	103.68	0.018761	3.16	6.78	30.5	0.57	0.8
UT3 PROP	1500	Q10	86	102.61	104.25		104.35	0.010809	3.77	51.93	79.76	0.71	0.91
UT3 PROP	1400	DesignQ	6	101.63	102.16		102.17	0.005984	1.25	7.41	19.97	0.11	0.15
UT3 PROP	1400	Q1.1	7	101.63	102.2		102.21	0.005927	1.29	8.25	20.39	0.12	0.16
UT3 PROP	1400	Q1.5	11	101.63	102.35		102.37	0.005604	1.43	11.41	21.67	0.17	0.18
UT3 PROP	1400	Q2	15	101.63	102.38		102.41	0.008647	1.82	12.15	21.96	0.36	0.29
UT3 PROP	1400	Q10	86	101.63	103.27		103.35	0.009055	3.45	52.44	73.71	0.64	0.76
UT3 PROP	1300	DesignQ	6	100.16	100.61	100.61	100.8	0.054496	3.47	1.73	4.65	4.18	1.2
UT3 PROP	1300	Q1.1	7	100.16	100.66	100.66	100.86	0.052809	3.6	1.94	4.81	4.55	1.26
UT3 PROP	1300	Q1.5	11	100.16	100.8	100.8	101.06	0.052322	4.12	2.67	5.34	6.34	1.54
UT3 PROP	1300	Q2	15	100.16	101.05	101.05	101.17	0.018801	3.05	8.64	43.64	0.4	0.76
UT3 PROP	1300	Q10	86	100.16	101.52	101.52	101.78	0.032556	5.67	29.97	47.2	3.63	2.21
UT3 PROP	1200	DesignQ	6	97.2	97.92		97.98	0.010077	1.93	3.11	5.63	0.63	0.33
UT3 PROP	1200	Q1.1	7	97.2	97.98		98.05	0.010187	2.02	3.46	5.85	0.71	0.35
UT3 PROP	1200	Q1.5	11	97.2	98.16		98.25	0.01049	2.42	4.92	11.4	0.61	0.46
UT3 PROP	1200	Q2	15	97.2	98.27		98.39	0.011476	2.78	6.55	16.61	0.63	0.59
UT3 PROP	1200	Q10	86	97.2	99.04		99.25	0.014761	4.81	36.6	48.97	1.59	1.42
UT3 PROP	1100	DesignQ	6	96.17	96.87		96.93	0.010975	1.98	3.03	5.63	0.69	0.35
UT3 PROP	1100	Q1.1	7	96.17	96.94		97	0.010679	2.05	3.43	7.09	0.62	0.36
UT3 PROP	1100	Q1.5	11	96.17	97.1		97.19	0.010731	2.4	5.72	21.96	0.33	0.46
UT3 PROP	1100	Q2	15	96.17	97.23		97.32	0.009751	2.55	9.34	35.27	0.25	0.49
UT3 PROP	1100	Q10	86	96.17	98.02		98.13	0.008396	3.65	49.27	62.37	0.71	0.81
UT3 PROP	1000	DesignQ	6	95.14	95.87		95.93	0.009299	1.87	3.22	5.75	0.57	0.3
UT3 PROP	1000	Q1.1	7	95.14	95.93		95.99	0.009445	1.96	3.57	5.98	0.65	0.33
UT3 PROP	1000	Q1.5	11	95.14	96.12		96.2	0.009161	2.31	5.22	11.89	0.51	0.42
UT3 PROP	1000	Q2	15	95.14	96.25		96.35	0.009691	2.63	7.02	17.39	0.51	0.51
UT3 PROP	1000	Q10	86	95.14	96.95	96.88	97.11	0.012791	4.41	45.62	80	0.85	1.2
UT3 PROP	900	DesignQ	6	94.11	94.77		94.84	0.013053	2.09	3.34	14.58	0.33	0.39
UT3 PROP	900	Q1.1	7	94.11	94.81		94.88	0.013275	2.18	4.06	17.97	0.31	0.42
UT3 PROP	900	Q1.5	11	94.11	94.92	94.82	95.01	0.015953	2.59	6.41	26.58	0.4	0.57
UT3 PROP	900	Q2	15	94.11	95	94.92	95.11	0.016409	2.86	8.97	35.81	0.42	0.67
UT3 PROP	900	Q10	86	94.11	95.65		95.77	0.013949	4.08	46.34	80	0.92	1.09
UT3 PROP	800	DesignQ	6	93.08	93.88		93.92	0.006753	1.66	3.62	6.07	0.39	0.24

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Power Total (lb/ft s)	Shear Chan (lb/sq ft)
UT3 PROP	800	Q1.1	7	93.08	93.93		93.97	0.006614	1.73	5.2	36.65	0.08	0.25
UT3 PROP	800	Q1.5	11	93.08	94.07		94.11	0.005679	1.83	11.21	48.92	0.08	0.26
UT3 PROP	800	Q2	15	93.08	94.14		94.18	0.005749	1.95	16.88	80	0.07	0.29
UT3 PROP	800	Q10	86	93.08	94.69		94.75	0.007624	3.13	60.68	80	0.5	0.63
UT3 PROP	700	DesignQ	6	92.05	92.6		92.71	0.026888	2.7	2.24	6.86	1.41	0.69
UT3 PROP	700	Q1.1	7	92.05	92.63	92.54	92.76	0.02884	2.9	2.53	8.8	1.38	0.78
UT3 PROP	700	Q1.5	11	92.05	92.74	92.72	92.93	0.037057	3.58	3.6	12.83	1.91	1.15
UT3 PROP	700	Q2	15	92.05	92.86	92.86	93.05	0.031062	3.62	5.78	21.97	1.28	1.11
UT3 PROP	700	Q10	86	92.05	93.62		93.75	0.013534	4.09	44.97	69.04	1.03	1.09
UT3 PROP	600	DesignQ	6	90.55	91.26		91.3	0.008441	1.74	4.39	13.37	0.23	0.27
UT3 PROP	600	Q1.1	7	90.55	91.32		91.36	0.008019	1.77	5.22	14.7	0.23	0.27
UT3 PROP	600	Q1.5	11	90.55	91.49		91.54	0.00691	1.94	8.51	23.96	0.19	0.3
UT3 PROP	600	Q2	15	90.55	91.61		91.67	0.007459	2.22	11.91	38.01	0.18	0.37
UT3 PROP	600	Q10	86	90.55	92.18		92.33	0.014986	4.42	43.49	69.95	1.12	1.25
UT3 PROP	500	DesignQ	6	89.59	90.29	90.04	90.35	0.010817	1.96	3.06	5.71	0.67	0.34
UT3 PROP	500	Q1.1	7	89.59	90.34		90.41	0.011707	2.11	3.32	5.88	0.82	0.39
UT3 PROP	500	Q1.5	11	89.59	90.43	90.24	90.53	0.015996	2.67	6.42	62.44	0.17	0.6
UT3 PROP	500	Q2	15	89.59	90.49	90.49	90.6	0.016692	2.89	10.25	66.39	0.23	0.68
UT3 PROP	500	Q10	86	89.59	91.1		91.17	0.009079	3.25	57.95	80	0.6	0.7
UT3 PROP	400	DesignQ	6	88.63	89.39		89.44	0.007884	1.75	4.07	21.93	0.13	0.27
UT3 PROP	400	Q1.1	7	88.63	89.44		89.49	0.007411	1.77	5.95	43.4	0.07	0.27
UT3 PROP	400	Q1.5	11	88.63	89.58		89.61	0.005648	1.76	12.1	48.04	0.08	0.25
UT3 PROP	400	Q2	15	88.63	89.67		89.7	0.005182	1.83	16.79	54.23	0.09	0.26
UT3 PROP	400	Q10	86	88.63	90.25		90.32	0.007936	3.21	58.56	80	0.52	0.66
UT3 PROP	300	DesignQ	6	87.68	88.34		88.41	0.01347	2.13	2.82	5.49	0.87	0.41
UT3 PROP	300	Q1.1	7	87.68	88.38		88.46	0.015081	2.32	3.02	5.63	1.1	0.48
UT3 PROP	300	Q1.5	11	87.68	88.51	88.33	88.64	0.019647	2.92	3.82	10.62	1.22	0.72
UT3 PROP	300	Q2	15	87.68	88.6	88.45	88.77	0.021521	3.35	5.96	43.66	0.46	0.91
UT3 PROP	300	Q10	86	87.68	89.2		89.31	0.013472	3.98	49.52	80	0.89	1.04
UT3 PROP	200	DesignQ	6	86.72	87.37		87.4	0.007703	1.59	7.06	36.13	0.08	0.23
UT3 PROP	200	Q1.1	7	86.72	87.41		87.43	0.007167	1.58	8.48	37.86	0.08	0.22
UT3 PROP	200	Q1.5	11	86.72	87.52		87.55	0.006477	1.64	13.18	43.11	0.1	0.23
UT3 PROP	200	Q2	15	86.72	87.6		87.62	0.006422	1.76	16.67	48.6	0.12	0.26
UT3 PROP	200	Q10	86	86.72	88.22		88.28	0.00786	3.01	59.16	80	0.52	0.6
UT3 PROP	100	DesignQ	6	85.76	86.49	86.21	86.55	0.009501	1.88	3.19	5.74	0.58	0.31
UT3 PROP	100	Q1.1	7	85.76	86.55	86.25	86.61	0.009504	1.97	3.56	5.98	0.65	0.33
UT3 PROP	100	Q1.5	11	85.76	86.7	86.41	86.77	0.009514	2.27	7.66	50.09	0.13	0.41
UT3 PROP	100	Q2	15	85.76	86.78	86.53	86.85	0.009507	2.43	12.56	68.62	0.13	0.46
UT3 PROP	100	Q10	86	85.76	87.34	87.13	87.41	0.009502	3.43	56.38	80	0.63	0.77

Reach UT2

Hydraulic Design Data

Stable Channel Design Results - Copeland Method

d84(mm) = 3.0, D50(mm) = .40, D16(mm) = .10

Temperature (F)	55
Specific Gravity of Sediments	2.65
Unit Weight of Water (lb/cu ft)	62.385
Viscosity (sq ft/s)	1.32E-05
Discharge (cfs)	4

Upstream Channel

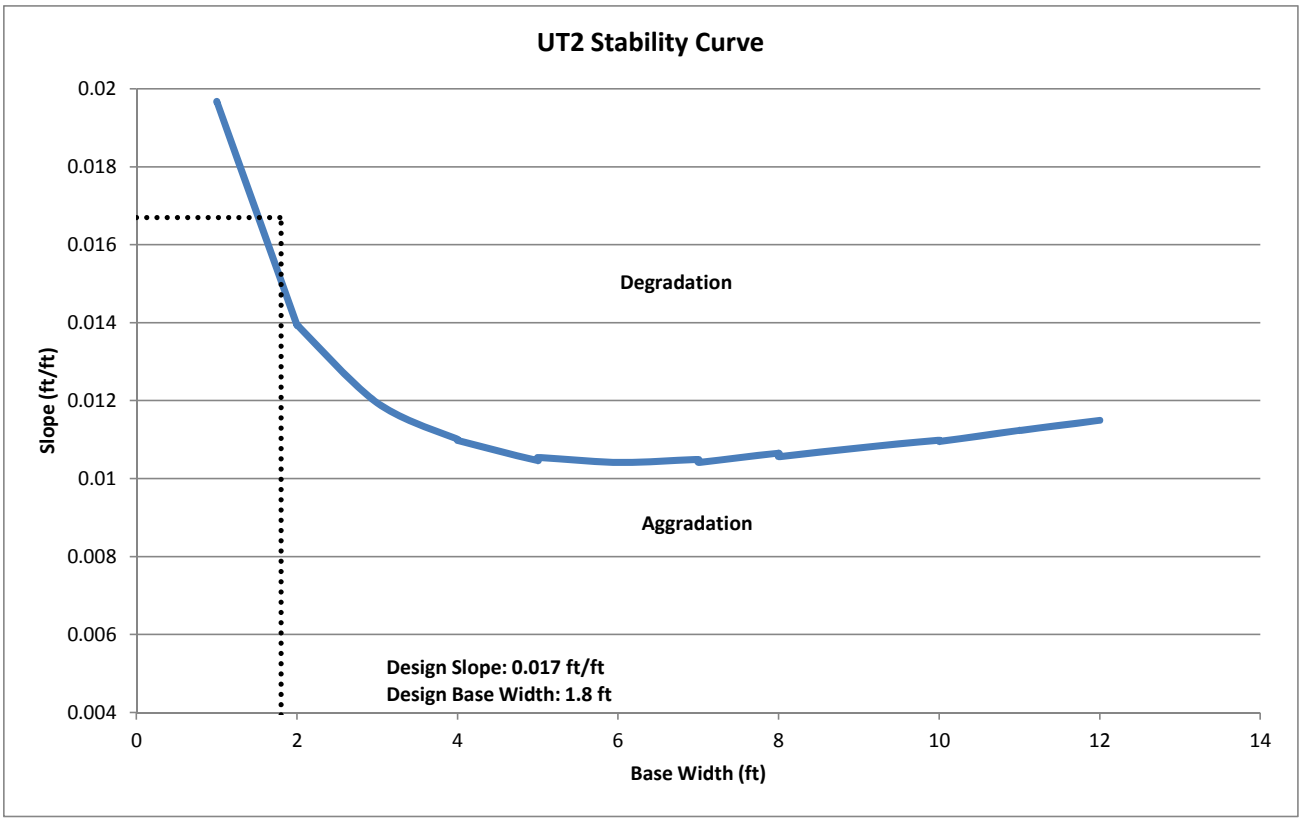
Sediment Concentration (ppm)	6000

Stable Channel

Median Channel Width (ft)	6	
Valley Slope(ft/ft)	0.023	
	Left	Right
Side Slope	1.8	1.8
Roughness Eq	Manning	Manning
Roughness Value	0.048	0.048

Computed Stable Channels

Bottom Width	Depth	Energy Slope	Comp n-Value	Hyd Radius	Velocity	Froude Number	Shear Stress	Regime
1	0.7	0.019672	0.0409	0.39	2.73	0.59	0.82	Upper
1	1.7	0.01968	0.0409	0.39	2.73	0.37	2.05	Upper
2	0.5	0.013937	0.0348	0.37	2.6	0.63	0.45	Upper
2	1.5	0.013948	0.0347	0.37	2.6	0.37	1.32	Upper
3	0.4	0.011946	0.0298	0.33	2.58	0.71	0.31	Upper
4	0.3	0.01101	0.0263	0.29	2.57	0.78	0.23	Upper
4	1.3	0.010983	0.0264	0.29	2.57	0.39	0.92	Upper
5	0.3	0.010464	0.024	0.25	2.56	0.85	0.19	Upper*
5	1.3	0.010546	0.0239	0.25	2.56	0.4	0.84	Upper*
6	0.2	0.010418	0.0221	0.22	2.53	0.9	0.16	Upper*
7	0.2	0.010494	0.0207	0.2	2.5	0.95	0.14	Upper
7	1.2	0.01042	0.0208	0.2	2.5	0.4	0.79	Upper
8	0.2	0.010656	0.0199	0.18	2.46	0.98	0.13	Upper
8	1.2	0.010569	0.0199	0.18	2.47	0.4	0.79	Upper
9	0.2	0.010794	0.0192	0.17	2.43	1.02	0.12	Upper
10	0.2	0.010988	0.0187	0.16	2.4	1.05	0.11	Upper*
10	1.2	0.010955	0.0188	0.16	2.4	0.39	0.79	Upper*
11	0.2	0.011242	0.0185	0.15	2.36	1.07	0.11	Upper*
11	1.2	0.011239	0.0184	0.15	2.36	0.39	0.81	Upper*
12	0.1	0.011499	0.018	0.14	2.33	1.1	0.1	Upper
*******Solution for Minimum Stream Power*******								
6.1	0.2	0.0104	0.0221	0.22	2.53	0.91	0.16	Upper


UT2 Stability Curve
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
Slope (ft/ft)
Degradation
Aggradation
Design Slope: 0.017 ft/ft
Design Base Width: 1.8 ft
0
2
4
6
8
10
12
14
Base Width (ft)

Reach UT3

Hydraulic Design Data

Stable Channel Design Results - Copeland Method

d84(mm) = 2.0, D50(mm) = .40, D16(mm) = .10

Temperature (F)	55
Specific Gravity of Sediments	2.65
Unit Weight of Water (lb/cu ft)	62.385
Viscosity (sq ft/s)	1.32E-05
Discharge (cfs)	6

Upstream Channel

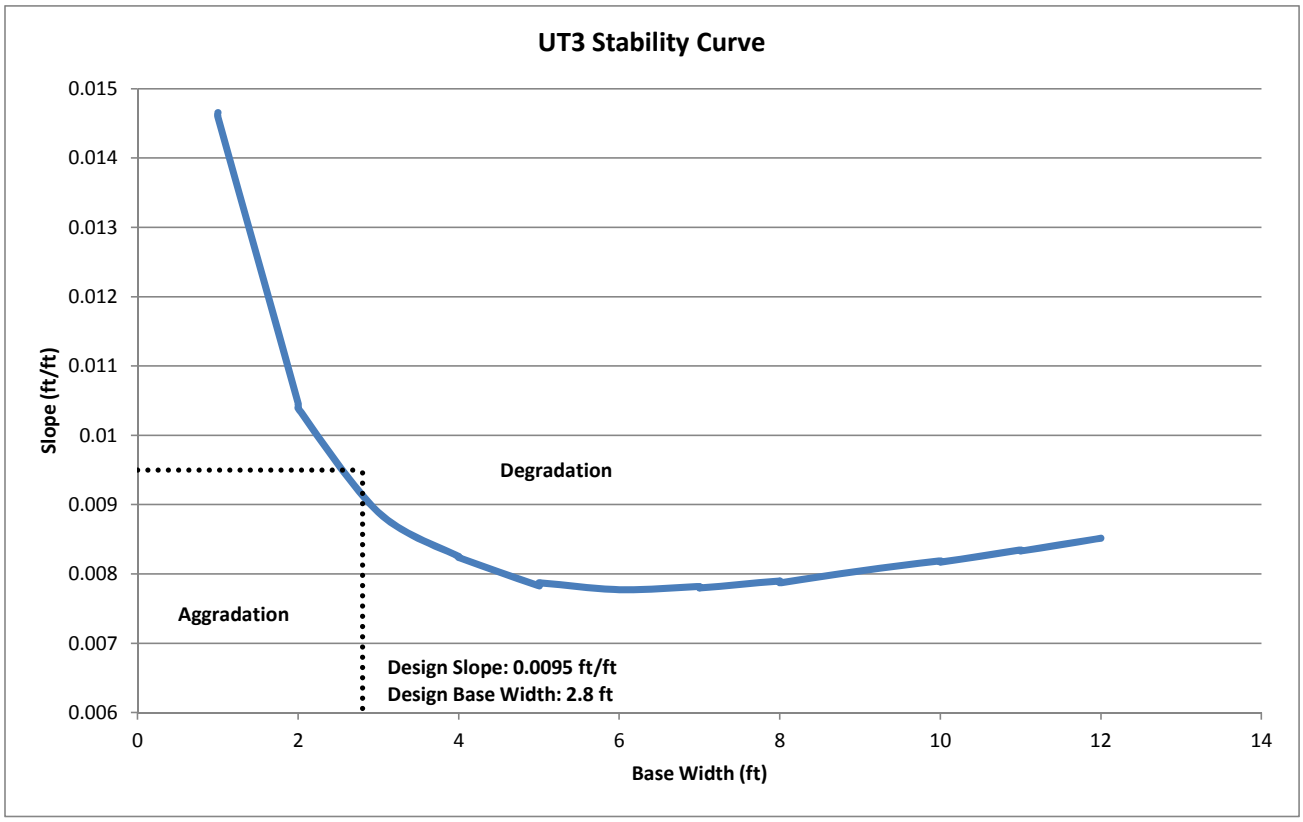
Sediment Concentration (ppm)	5215.3	
Base Width (ft)	3.5	
Channel Slope (ft/ft)	0.0098	
	Left	Right
Side Slope	1.9	1.9
Roughness Eq	Manning	Manning
Roughness Value	0.047	0.047

Stable Channel

Median Channel Width (ft)	6	
Valley Slope(ft/ft)	0.015	
	Left	Right
Side Slope	1.9	1.9
Roughness Eq	Manning	Manning
Roughness Value	0.037	0.037

Computed Stable Channels

Bottom Width	Depth	Energy Slope	Comp n-Value	Hyd Radius	Velocity	Froude Number	Shear Stress	Regime
1	0.8	0.014659	0.0326	0.44	3.16	0.63	0.7	Upper
1	1.8	0.014592	0.0328	0.44	3.17	0.42	1.61	Upper
2	0.6	0.010465	0.0289	0.43	2.95	0.65	0.41	Upper
2	1.6	0.01039	0.0292	0.43	2.96	0.41	1.06	Upper
3	0.5	0.00889	0.0262	0.4	2.89	0.71	0.29	Upper*
4	0.4	0.008253	0.0238	0.36	2.85	0.76	0.22	Upper*
4	1.4	0.008238	0.0238	0.36	2.85	0.42	0.74	Upper*
5	0.4	0.007831	0.022	0.32	2.82	0.82	0.18	Upper*
5	1.4	0.007874	0.022	0.32	2.82	0.42	0.67	Upper*
6	0.3	0.007775	0.0207	0.29	2.78	0.86	0.16	Upper*
7	0.3	0.00782	0.0198	0.27	2.74	0.9	0.14	Upper*
7	1.3	0.007798	0.0198	0.27	2.74	0.43	0.63	Upper*
8	0.3	0.007901	0.019	0.24	2.7	0.93	0.13	Upper*
8	1.3	0.007874	0.019	0.24	2.7	0.42	0.62	Upper*
9	0.2	0.008046	0.0183	0.22	2.65	0.96	0.12	Upper
10	0.2	0.008191	0.0181	0.21	2.61	0.98	0.11	Upper
10	1.2	0.008171	0.0181	0.21	2.62	0.42	0.62	Upper
11	0.2	0.008348	0.0177	0.2	2.58	1	0.11	Upper
11	1.2	0.008332	0.0178	0.2	2.58	0.41	0.63	Upper
12	0.2	0.008517	0.0175	0.18	2.54	1.02	0.1	Upper*
*******Solution for Minimum Stream Power*******								
6.2	0.3	0.007768	0.0205	0.29	2.77	0.87	0.15	Upper*


UT3 Stability Curve
Slope (ft/ft)
0.015
0.014
0.013
0.012
0.011
0.01
0.009
0.008
0.007
0.006
Degradation
Aggradation
Design Slope: 0.0095 ft/ft
Design Base Width: 2.8 ft
0
2
4
6
8
10
12
14
Base Width (ft)

WETLAND RESTORATION-CEDAR CREEK SITE
Coastal Plain Small Stream Swamp
Water Balance

Proposed Wetland WR-A Restoration

Watershed Composite Curve Number					
Landuse	**Soil Series**	**Hydrologic Soil Group**	**Acres**	**CN**	**Product (Ac x CN)**
Agriculture	FaA	B	2.7	74	202
	FaB	B	3.8	74	284
Forested	BH	D	5.4	77	416
	FaA	B	0.2	55	10
	FaB	B	13.5	55	743
	Jo	C	0.9	70	60
	MaC	B	13.2	55	726
	WaB	A	0.7	30	21
Impervious area	BoB	A	1.6	98	153
	FaA	B	0.4	98	38
	FaB	B	3.3	98	325
	MaC	B	0.6	98	56
	NoB	A	1.1	98	111
	WaB	A	9.6	98	942
Maintained open space	BoB	A	5.8	39	228
	FaA	B	1.6	61	100
	FaB	B	15.0	61	913
	Jo	C	0.2	74	15
	MaC	B	10.7	61	651
	NoB	A	8.0	39	310
	WaB	A	17.0	39	664
Pasture	FaA	B	1.2	1	1
Residential	FaA	B	1.2	68	83
	FaB	B	6.7	68	453
	MaC	B	2.1	68	146
Row crops	FaA	B	14.7	80	1,174
	FaB	B	26.6	80	2,130
	Jo	C	0.1	87	6
	MaC	B	1.1	80	90
	NoB	A	0.1	70	9
	WaB	A	0.0	70	2
Water	BH	D	0.1	70	4
	MaC	B	0.4	70	27
	W	--	2.3	70	160
Total Watershed Acres		**172.0**	**Composite CN**		**11,257**
			Weighted CN =		**65.4**

Monthy Runoff Averages (acre in)

	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
Runoff (Q)	0.04	0.05	0.11	0.05	0.08	0.15	0.33	0.37	0.60	0.20	0.12	0.02
Runoff Seen on Site (acres inches)	**6.56**	**8.83**	**18.77**	**8.49**	**13.90**	**25.73**	**56.06**	**64.30**	**103.23**	**34.15**	**20.61**	**2.79**

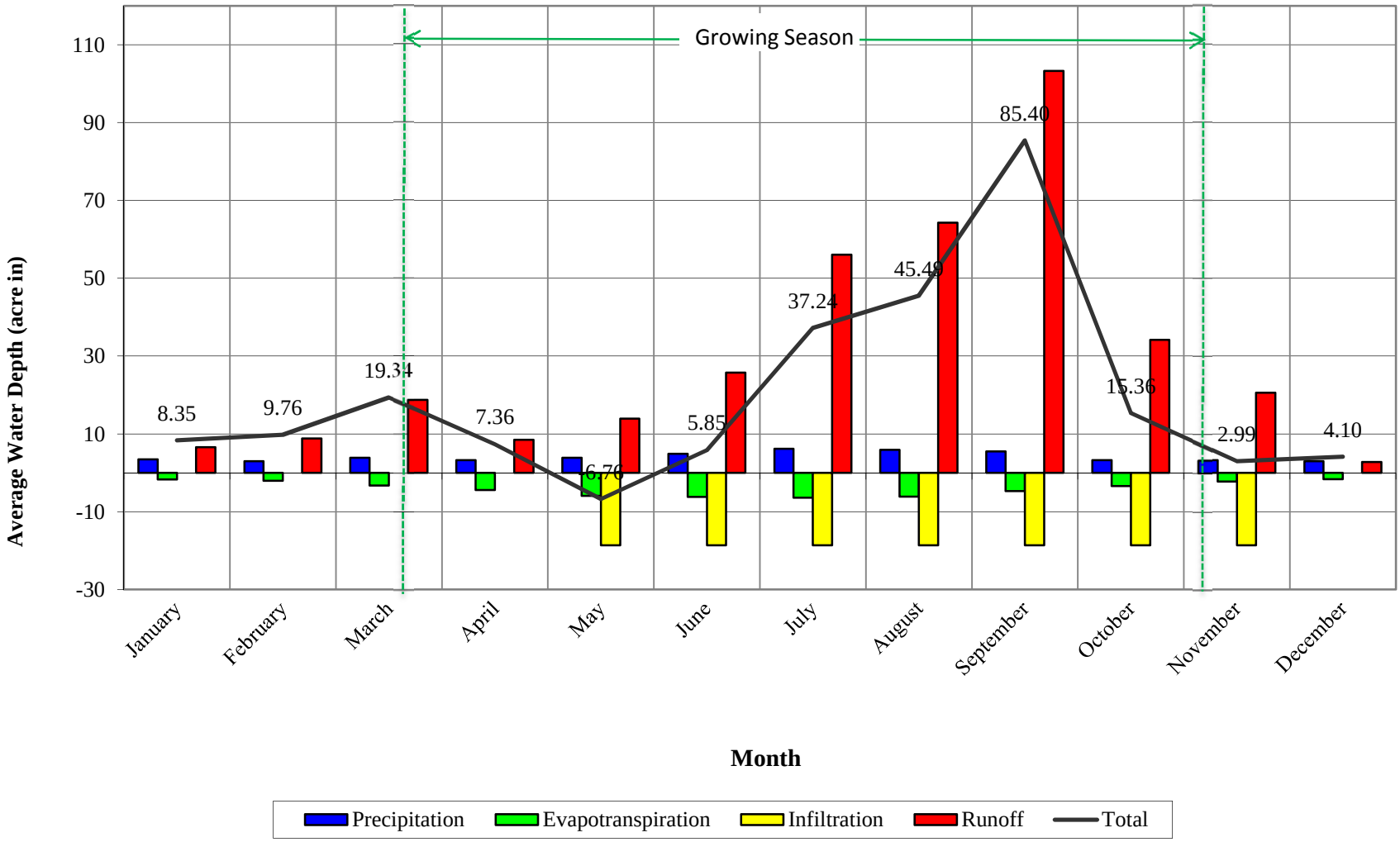
Proposed Wetland Area	Curve Number	24-HR Rainfall Record	Rainfall Needed for Runoff
Acres = 172.00	CN = 65.45	P24 = 6.6	Q = 1.0559

WATER BALANCE NET VALUES

	January	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**Total**
Precipitation	3.48	2.99	3.88	3.28	3.85	4.89	6.15	5.90	5.46	3.24	3.26	2.98	49.35
Evapotranspiration	-1.69	-2.05	-3.31	-4.42	-5.90	-6.17	-6.38	-6.11	-4.69	-3.42	-2.28	-1.66	-48.08
Infiltration+	0.0	0.0	0.0	0.0	-18.6	-18.6	-18.6	-18.6	-18.6	-18.6	-18.6	0.0	-130.20
Watershed Runoff	6.56	8.83	18.77	8.49	13.90	25.73	56.06	64.30	103.23	34.15	20.61	2.79	363.41
Total	**8.35**	**9.76**	**19.34**	**7.36**	**-6.76**	**5.85**	**37.24**	**45.49**	**85.40**	**15.36**	**2.99**	**4.10**	**234.47**

Precipitation data from Warsaw
ET data calcualated from weather data from Warsaw
+ based on estimated infiltration of 1millimeter per hour

HYDROGRAPH FOR
WETLAND RESTORATION
CEDAR CREEK



References :
The North Carolina State Climatologist;

APPENDIX D

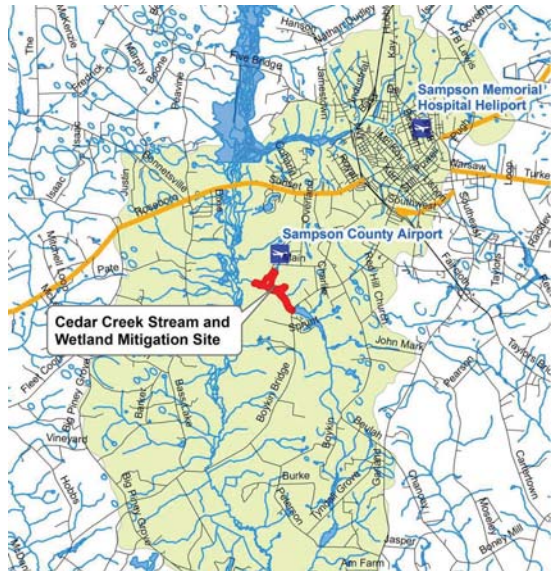
Cedar Creek Design Plan Sheets

CEDAR CREEK STREAM AND WETLAND MITIGATION PROJECT

NCEEP PROJECT ID #95718

APRIL 2014

LOCATION: SAMPSON COUNTY, NORTH CAROLINA

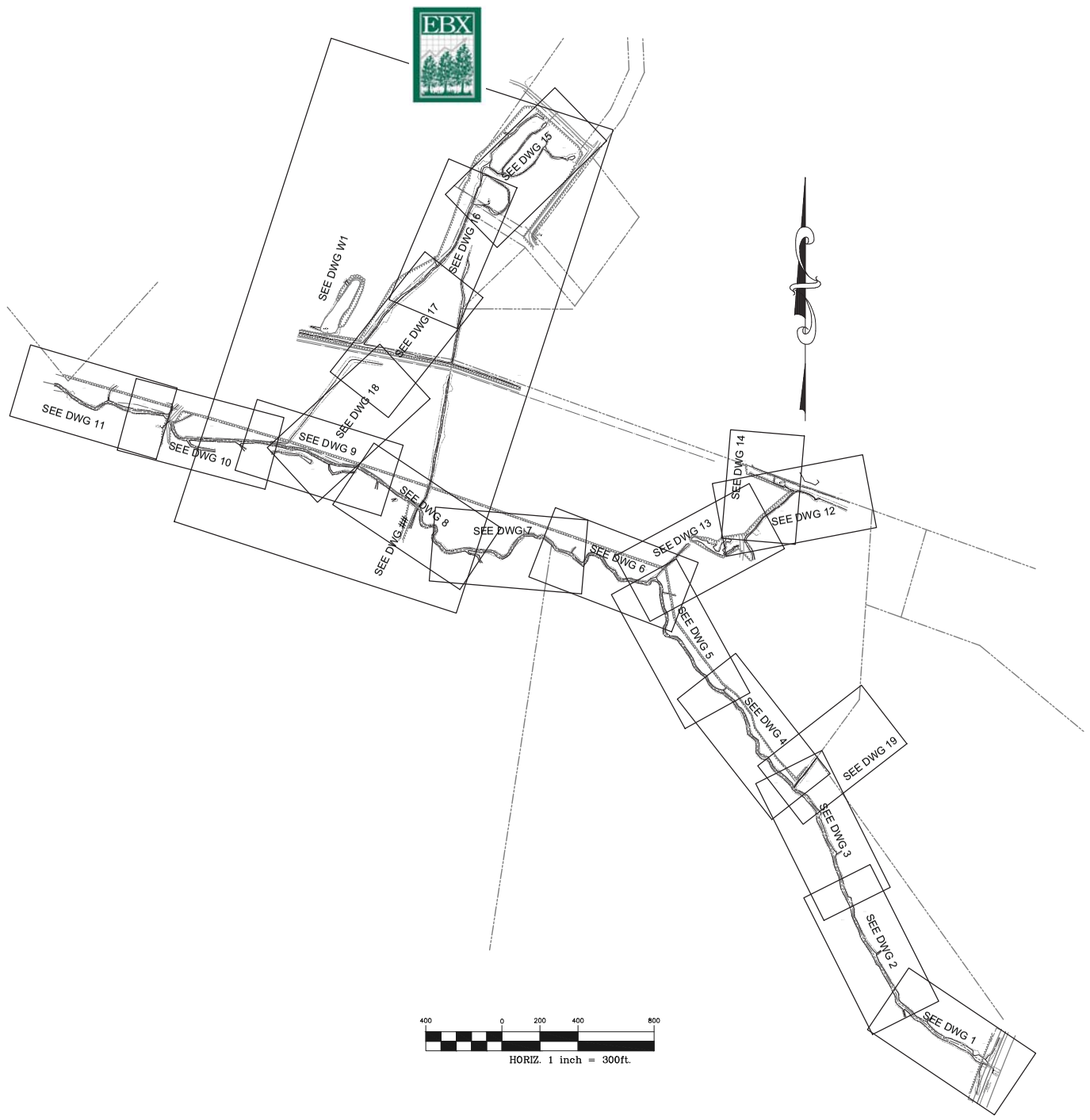


VICINITY MAP
NTS

ENVIRONMENTAL BANC & EXCHANGE, LLC

909 CAPABILITY DRIVE, SUITE 3100

RALEIGH, NC 27606



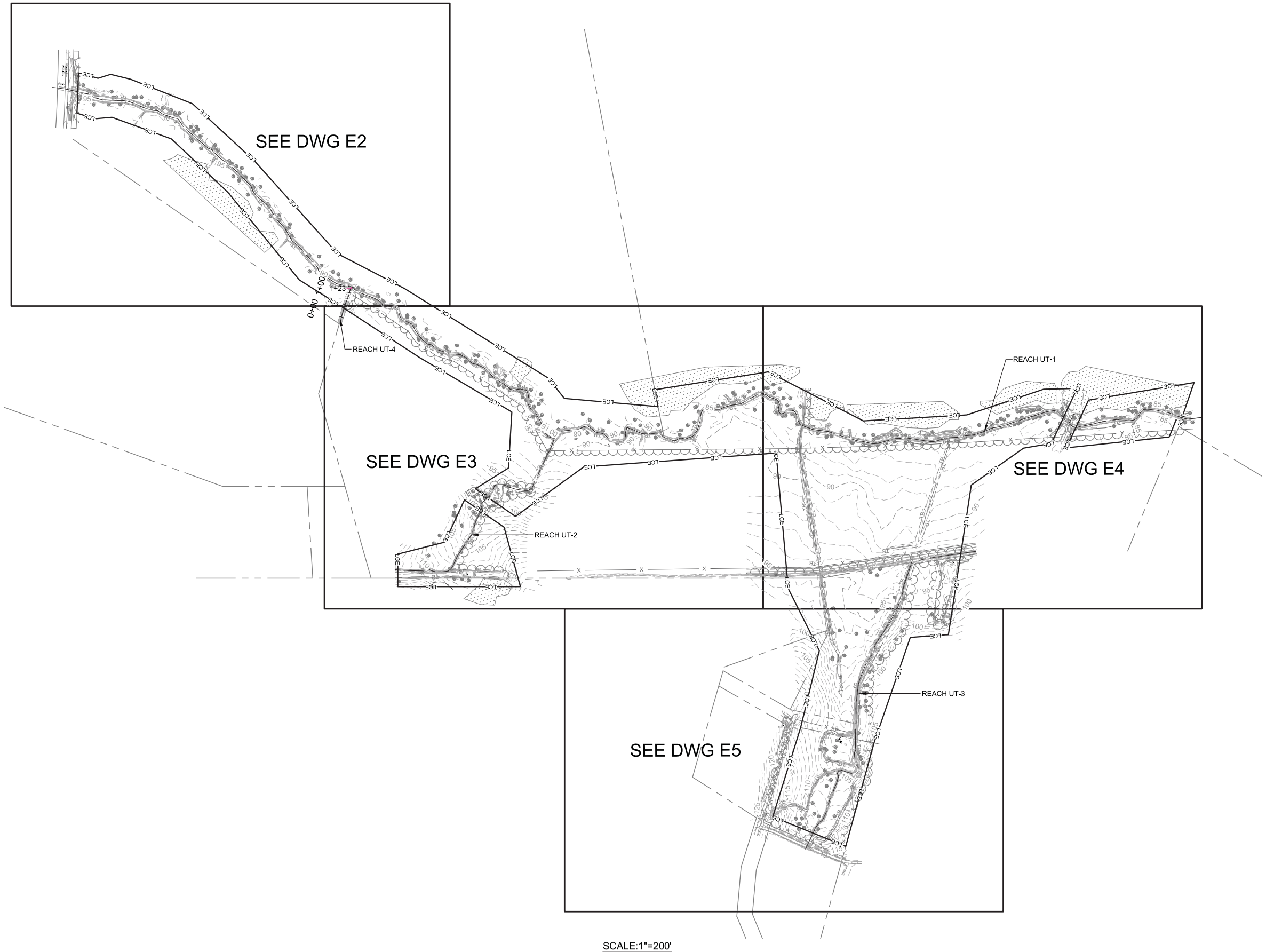
Drawing List Table	
Drawing Number	Drawing Title
--	COVER
E1	EXISTING CONDITIONS INDEX
E2	EXISTING CONDITIONS
E3	EXISTING CONDITIONS
E4	EXISTING CONDITIONS
E5	EXISTING CONDITIONS
1	PLAN AND PROFILE UT-1
2	PLAN AND PROFILE UT-1
3	PLAN AND PROFILE UT-1
4	PLAN AND PROFILE UT-1
5	PLAN AND PROFILE UT-1
6	PLAN AND PROFILE UT-1
7	PLAN AND PROFILE UT-1
8	PLAN AND PROFILE UT-1
9	PLAN AND PROFILE UT-1
10	PLAN AND PROFILE UT-1
11	PLAN AND PROFILE UT-1
12	PLAN AND PROFILE UT-2
13	PLAN AND PROFILE UT-2
14	PLAN AND PROFILE UT-2C
15	PLAN AND PROFILE UT-3
16	PLAN AND PROFILE UT-3
17	PLAN AND PROFILE UT-3
18	PLAN AND PROFILE UT-3
19	PLAN AND PROFILE UT-4
W1	WETLAND W1
P1	PLANTING PLAN
P2	PLANTING PLAN
P3	PLANTING PLAN
P4	PLANTING PLAN
M1	MONITORING LOCATIONS
D1	DETAILS
D2	DETAILS
D3	DETAILS
D4	DETAILS
D5	DETAILS

DESIGN CONSULTANT

WK DICKSON
community infrastructure consultants

720 CORPORATE CENTER DR
RALEIGH, NC 27607
(919) 782-0495

NC LICENSE NO. F-0374



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Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
www.wkdickson.com
NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PLOT DATE: 4/4/2014

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: EXISTING CONDITIONS INDEX

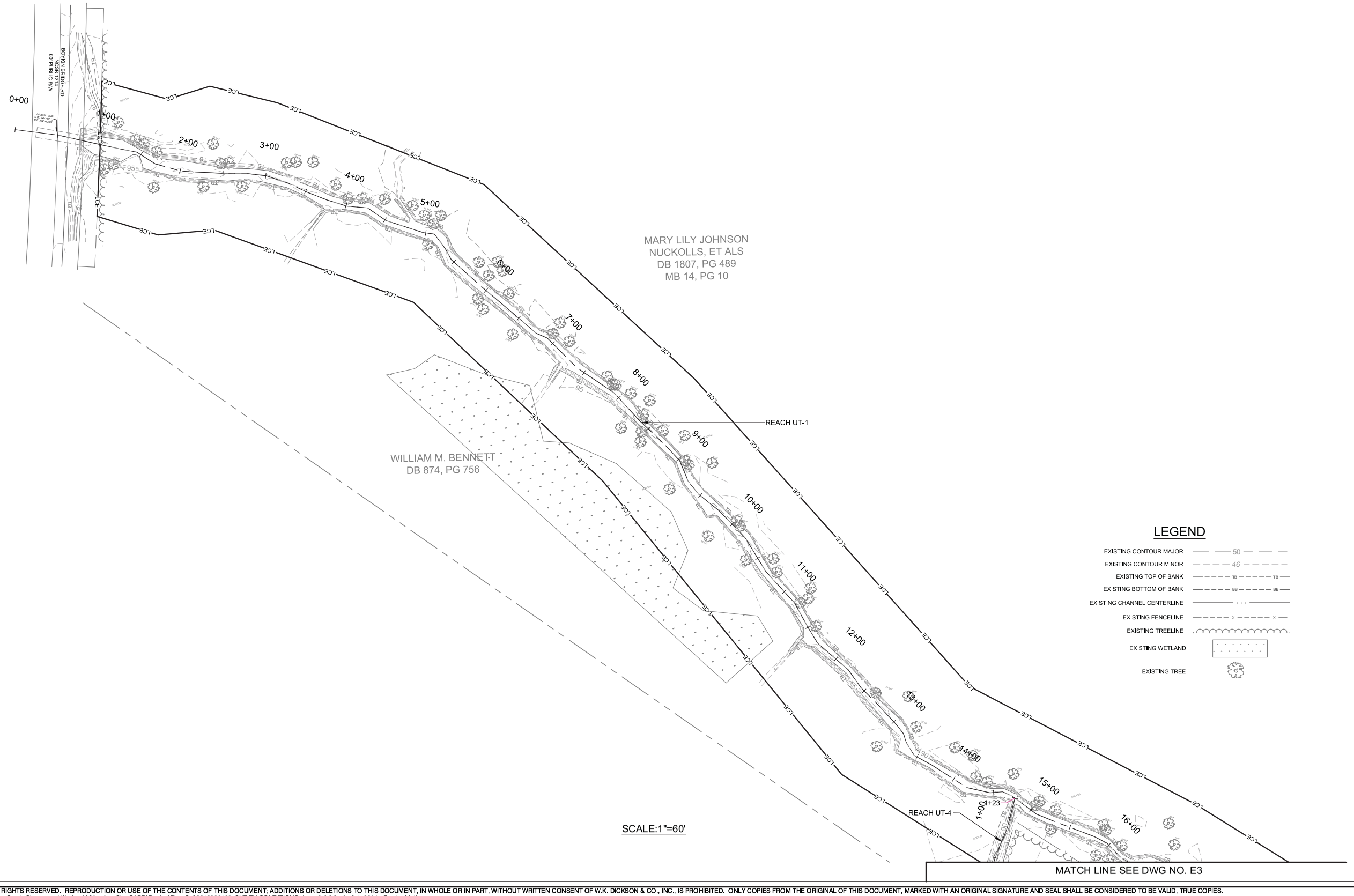
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
E1

PROJ. N0.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT EX CONDITIONS.dwg -#### - April 4, 2014 - Frasier Mullen



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EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PLOT DATE:
4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND
WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
EXISTING CONDITIONS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
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PROJ. NO.:
2013000100.RA

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MATCH LINE SEE DWG NO. E5

SCALE: 1"=60'

RALPH HARVEY HAMILTON DB 814, PG 82

DONALD RAY JORDAN DB 1737, PG 137

FRANCES J. HAMILTON HEIRS DB 915, PG 163

REACH UT-2

REACH UT-1

REACH UT-4

MARY LILY JOHNSON NUCKOLLS, ET ALS DB 1807, PG 489 MB 14, PG 10

RALPH H. HAMILTON DB 1148, PG 985 MB 1, PG 306

MATCH LINE SEE DWG NO. E4

MATCH LINE SEE DWG NO. E2

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING CHANNEL CENTERLINE
- EXISTING FENCELINE
- EXISTING TREELINE
- EXISTING WETLAND
- EXISTING TREE

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
EXISTING CONDITIONS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
E3

PROJ. NO.:
20130001000.RA

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PLOT DATE:
4/4/2014

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

EBX

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Urban Development + Geomatics
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Raleigh, NC 27607
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(f) 919.782.9672
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MATCH LINE SEE DWG NO. E3

RALPH H. HAMILTON
DB 1148, PG 985
MB 1, PG 306

RALPH H.
HAMILTON
DB 1148, PG 985
MB 1, PG 306

FRANCES J.
HAMILTON HEIRS
DB 915, PG 163

FRANCES J.
HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

FRANCES J.
HAMILTON HEIRS
DB 704, PG 150
DB 733, PG 298
DB 752, PG 729

SAMPSON
COUNTY
CITY OF CLINTON
DB 1616, PG 268

REACH UT-1

REACH UT-3

36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00

11+00 12+00 13+00 14+00 15+00 15+48

SCALE:1"=60'

MATCH LINE SEE DWG NO. E5

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING CHANNEL CENTERLINE
- EXISTING FENCELINE
- EXISTING TREELINE
- EXISTING WETLAND
- EXISTING TREE

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EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND
WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
EXISTING CONDITIONS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

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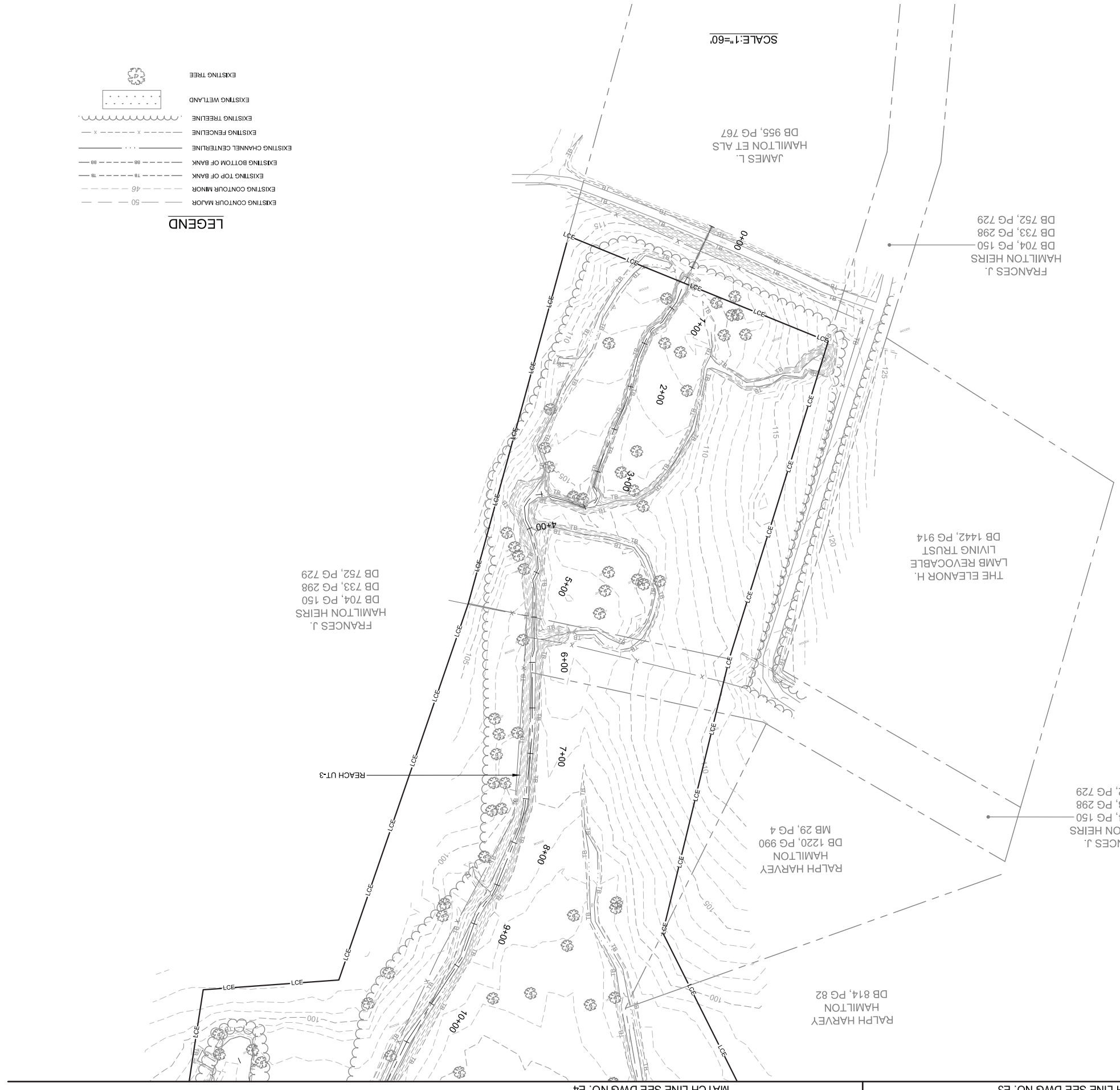

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- EXISTING CHANNEL CENTERLINE
- EXISTING FENCELINE
- EXISTING TREELINE
- EXISTING WETLAND
- EXISTING TREE

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
EXISTING CONDITIONS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
D.C.: FM
D.C. DATE: ---

DRAWING NUMBER:
E5

PROJ. NO.:
20130001.00.RA

MARK	DATE	DESCRIPTION
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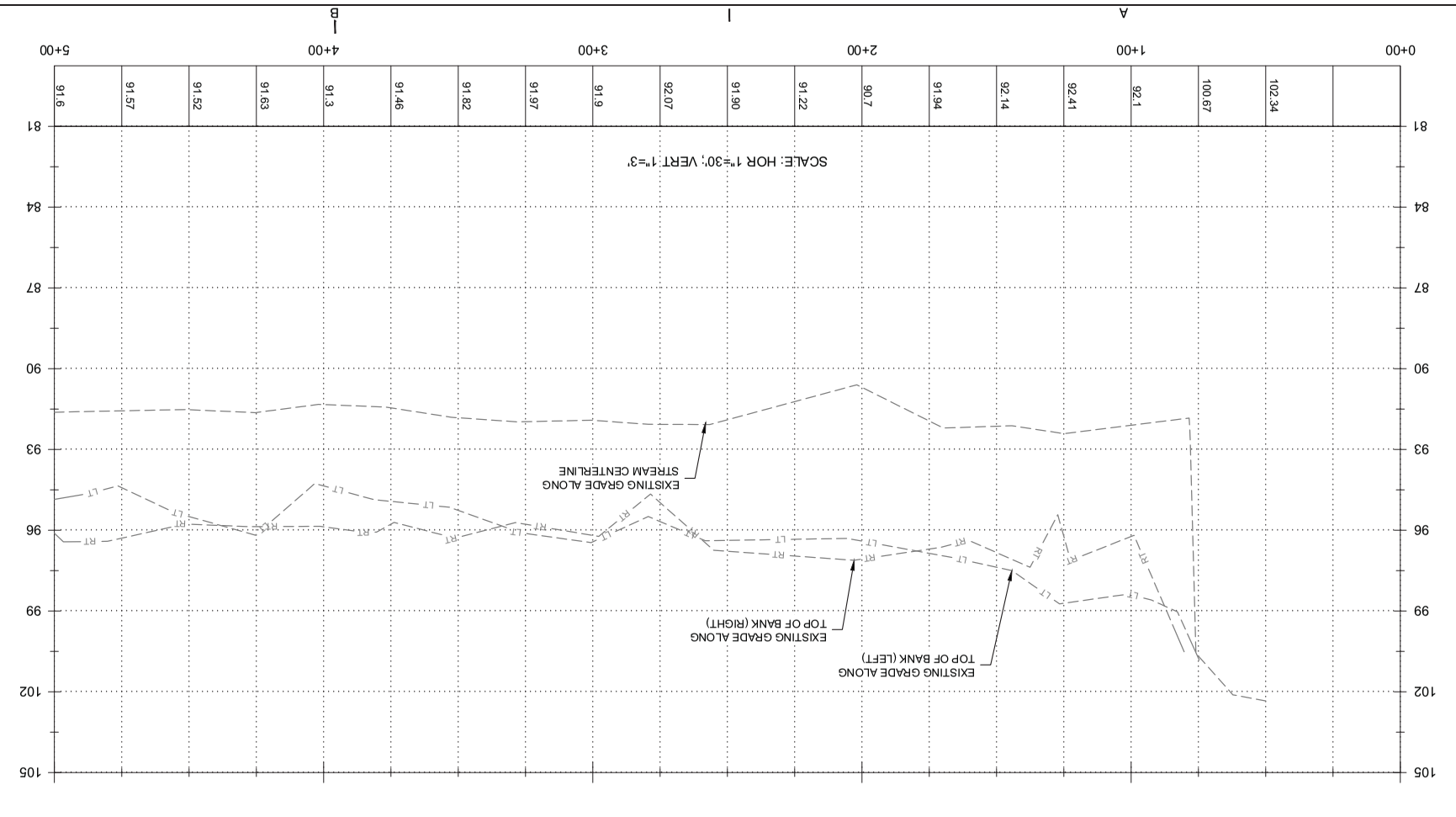
REVISIONS:
RELEASED FOR:

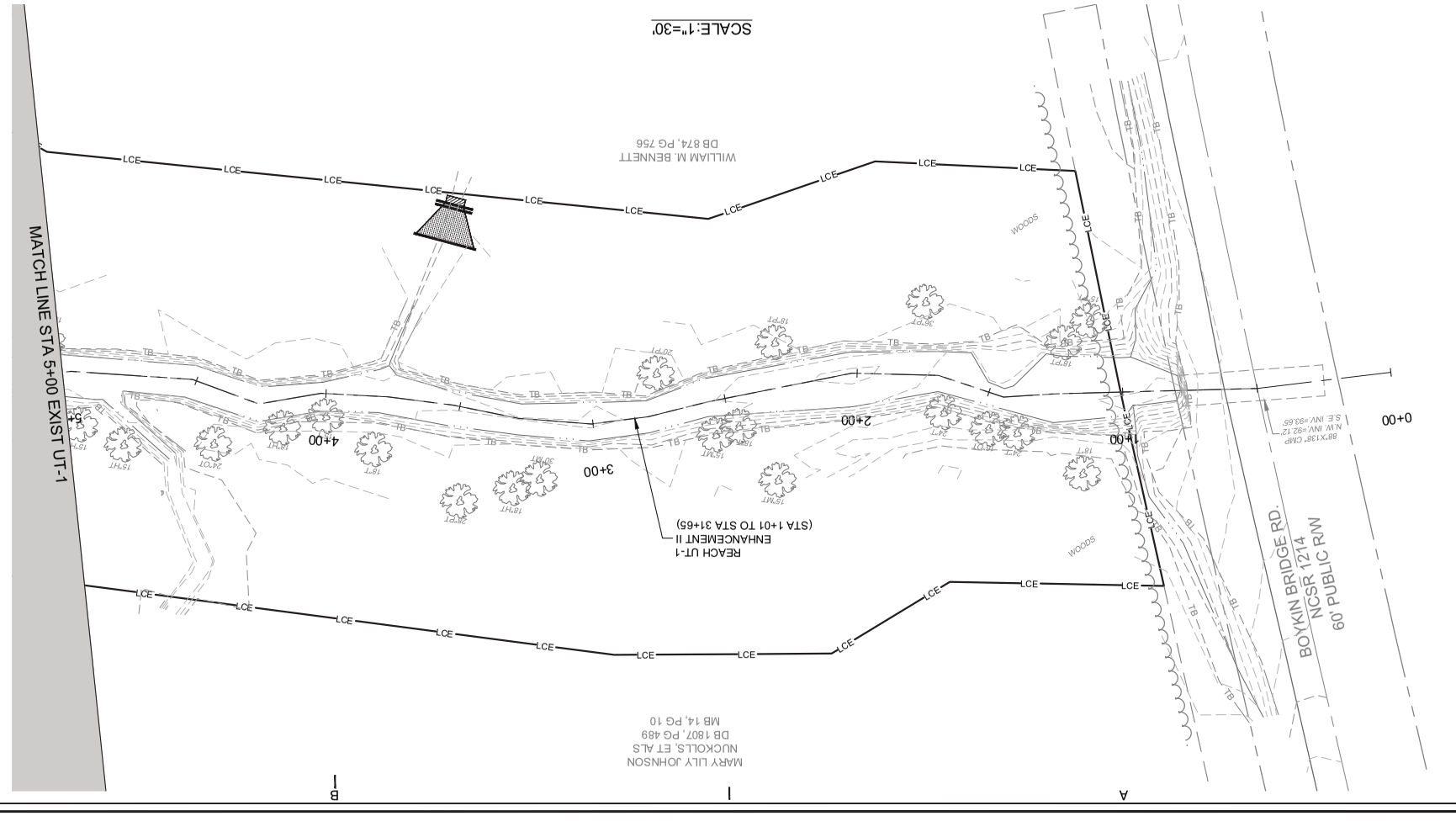
PLOT DATE:
4/4/2014

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

WK DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
www.wkdickson.com
NC LICENSE NO. F-0374

FILE NAME: I:\Projects\EBX\20130001000RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001000 SHT UT-1.dwg -#### - April 4, 2014 - Fraser Mullen





REACH UT-1 NOTES:

1. ALL BARE BANKS SHALL BE PLANTED WITH LIVE STAKES PER THE PLANTING PLAN, SEE SHEETS P1 THROUGH P4.
2. CONTRACTOR SHALL FLUSH-CUT ALL SWEETGUM, PINE, AND PRIVET ALONG THE RIGHT BANK AND WITHIN THE RIGHT BANK RIPARIAN AREA ALONG REACH UT-1.
3. ALL PRIVET SHALL BE TREATED AND REMOVED FROM THE LEFT BANK AND FROM WITHIN THE LEFT BANK RIPARIAN AREA ALONG REACH UT-1.
4. ALL SWEETGUM AND PRIVET STUMPS SHALL BE TREATED WITH HERBICIDE TO PREVENT FUTURE SPROUTING.
5. ALL CUT PRIVET MUST BE REMOVED FROM THE EASEMENT AND DISPOSED OFF OFF-SITE.
6. FOR PROPOSED ENHANCEMENT AND FLOODPLAIN GRADING, SEE TYPICAL BANK GRADING DETAILS ON SHEET D5.

NOTES:

1. IN GENERAL, STREAM CONSTRUCTION SHALL PROCEED FROM AN UPSTREAM TO DOWNSTREAM DIRECTION.
2. ALL EXCAVATED MATERIAL MUST BE PLACED WITHIN DESIGNATED STOCKPILE AREAS.
3. ALL IMPERVIOUS DIKES AND BYPASS PUMPING EQUIPMENT SHALL BE MODIFIED AT THE END OF EACH DAY TO RESTORE NORMAL FLOW BACK TO THE CHANNEL.
4. CONTRACTORS SHALL NOT COMPACT SOIL AROUND ROOTS OR TREES TO REMAIN AND SHALL NOT DAMAGE SUCH TREES IN ANY WAY. EXCAVATED OR OTHER MATERIAL SHALL NOT BE PLACED, PILED OR STORED WITHIN THE CRITICAL ROOT ZONE AREA OF THE TREES TO BE SAVED.
5. THE PROPOSED CROSS-SECTIONS SHALL TIE INTO EXISTING GRADE AT A MAXIMUM SLOPE OF 3H:1V. FOR ALL AREAS WHERE THE PROPOSED TOP OF BANK ELEVATION IS GREATER THAN 0.75' BELOW EXISTING GRADE, A BANKFULL BENCH MUST BE CONSTRUCTED. SEE TYPICAL CROSS SECTION GRADING DETAIL ON SHEET D5 FOR DIMENSIONS.
6. UNLESS NOTED OTHERWISE, FILL MATERIAL GENERATED FROM CHANNEL EXCAVATION AND STABILIZATION SHALL BE PLACED INSIDE THE EXISTING CHANNEL TO BE ABANDONED AT AN ELEVATION THAT PROVIDES POSITIVE DRAINAGE TOWARDS THE PROPOSED CHANNEL.
7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — 50
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER: 1

PROJ. NO.: 20130001000.RA

PLOT DATE: 4/4/2014

FULL SCALE: 1"= 30 (0, 30, 60)
2" = FULL SCALE
1" = HALF SCALE

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

W.K. DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
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(f) 919.782.9672
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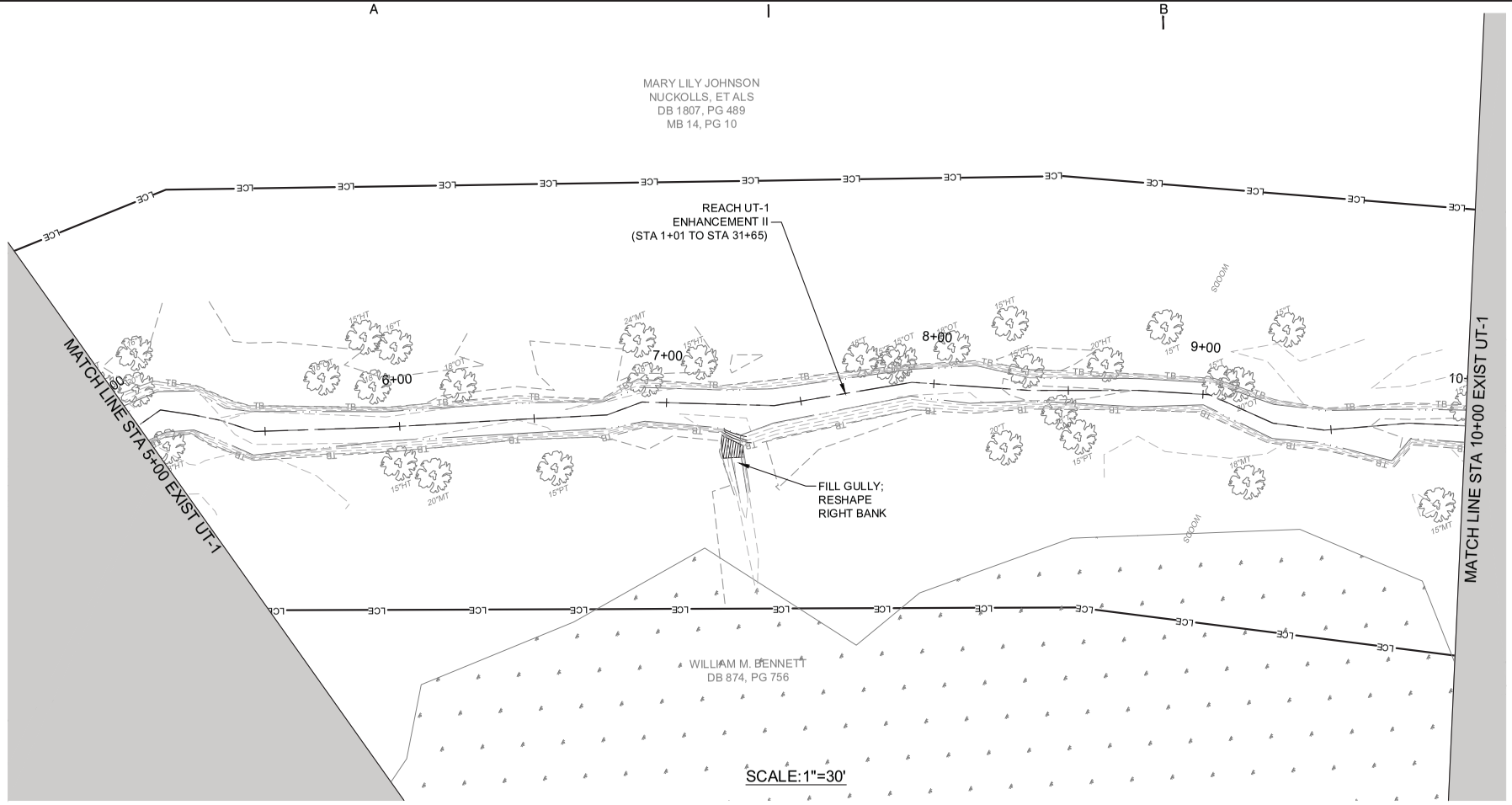

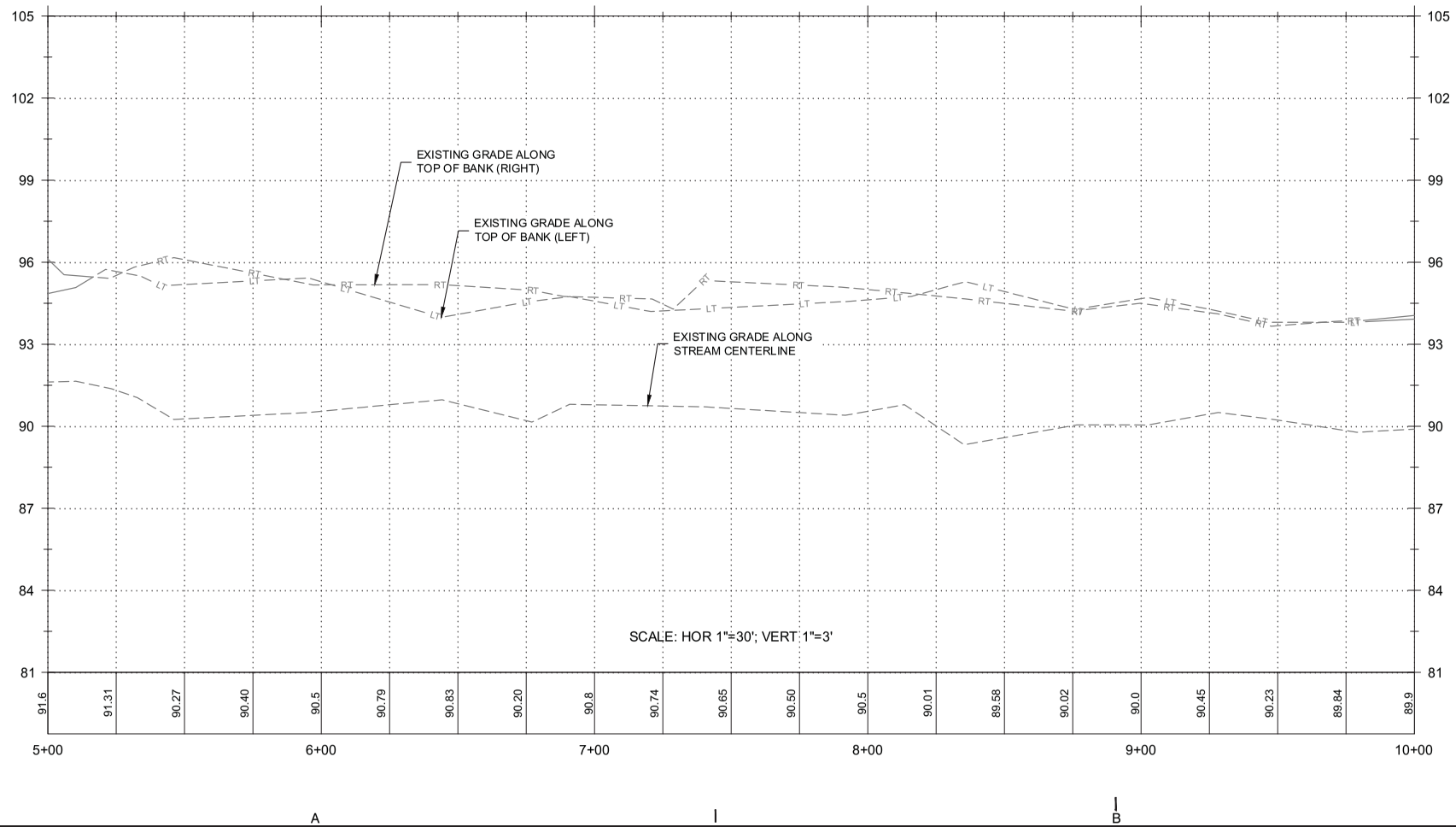

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LEGEND

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- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- EXISTING WETLAND
- EXISTING TOP OF BANK (TB)
- EXISTING BOTTOM OF BANK (BB)
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE (X)
- EXISTING TREELINE
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- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT (LCE)
- VEGETATED SILL (SEE DETAIL SHEET D2)
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- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
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NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

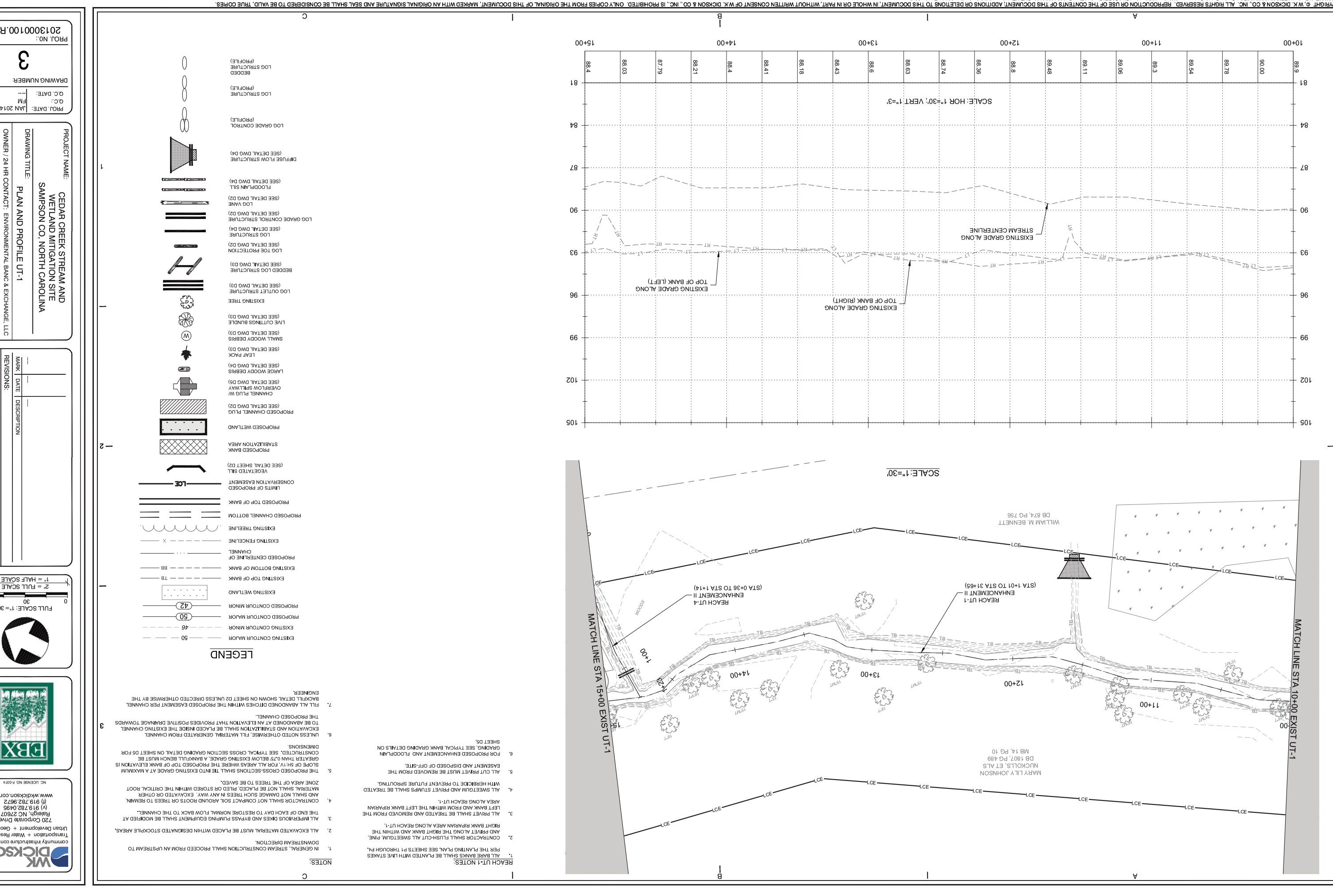
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER: 2

PROJ. N0.: 2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen

FILE NAME: I:\Projects\EBX\20130001\00A - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001 SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen



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LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — (50)
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED WETLAND
- PROPOSED BANK STABILIZATION AREA
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
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- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
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EBX

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE:	JAN 2014
D.G.:	FM
D.G. DATE:	---

DRAWING NUMBER: 3

PROJ. NO.: 20130001.00.RA

MARK	DATE	DESCRIPTION
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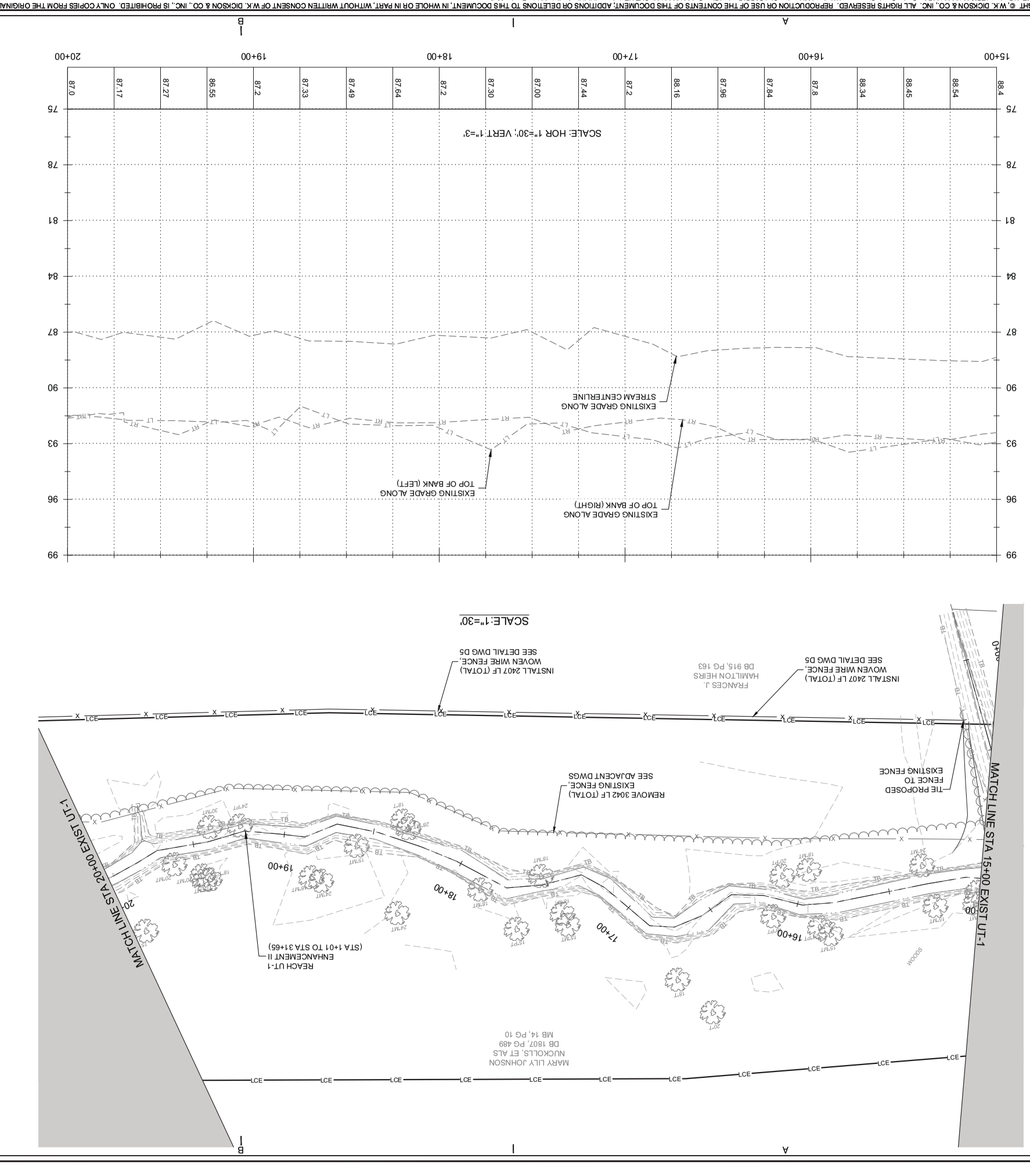
REVISIONS:

RELEASED FOR:

FILE NAME: I:\Projects\EBX\20130001004 - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001 SHT UT-1.dwg -#### - April 4, 2014 - Fraisier Mullen



NOTES:

1. IN GENERAL, STREAM CONSTRUCTION SHALL PROCEED FROM AN UPSTREAM TO DOWNSTREAM DIRECTION.
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LEGEND

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- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — 50
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
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PLOT DATE: 4/4/2014

PROJECT NAME:	CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO. NORTH CAROLINA
DRAWING TITLE:	PLAN AND PROFILE UT-1
OWNER / 24 HR CONTACT:	ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS:	909 CAPABILITY DR. SUITE 3100 . RALEIGH, NC 27606
PHONE:	
MOBILE:	

REVISIONS:			
MARK	DATE	DESCRIPTION	
---	---	---	

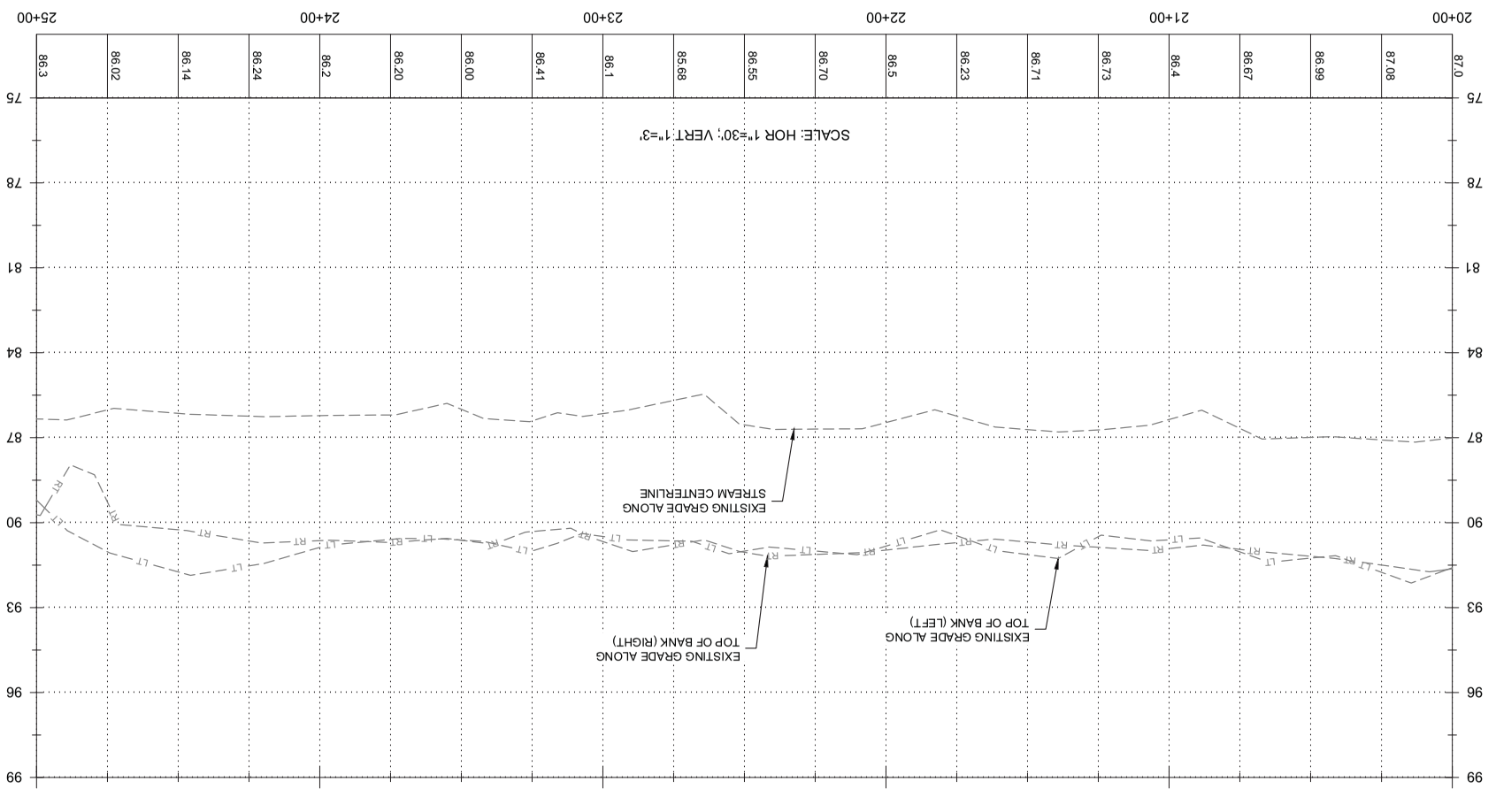
RELEASED FOR: ----

PROJ. DATE:	JAN 2014
D.C.:	FM
D.C. DATE:	---

DRAWING NUMBER: 4

PROJ. NO.: 20130001.00.RA

FILE NAME: I:\Projects\EBX\20130001000 - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001000 SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen



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5. THE PROPOSED CROSS-SECTIONS SHALL TIE INTO EXISTING GRADE AT A MAXIMUM SLOPE OF 5H:1V. FOR ALL AREAS WHERE THE PROPOSED TOP OF BANK ELEVATION IS GREATER THAN 0.75' BELOW EXISTING GRADE, A BANKFULL BENCH MUST BE CONSTRUCTED. SEE TYPICAL CROSS SECTION GRADING DETAIL ON SHEET D5 FOR DIMENSIONS.
6. UNLESS NOTED OTHERWISE, FILL MATERIAL GENERATED FROM CHANNEL EXCAVATION AND STABILIZATION SHALL BE PLACED INSIDE THE EXISTING CHANNEL TO BE ABANDONED AT AN ELEVATION THAT PROVIDES POSITIVE DRAINAGE TOWARDS THE PROPOSED CHANNEL.
7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — (50)
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

FULL SCALE: 1"= 30

0 30 60

2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
5

PROJ. NO.:
20130001.00.RA

MARK	DATE	DESCRIPTION
---	---	---

REVISIONS:

RELEASED FOR:

W.K. DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
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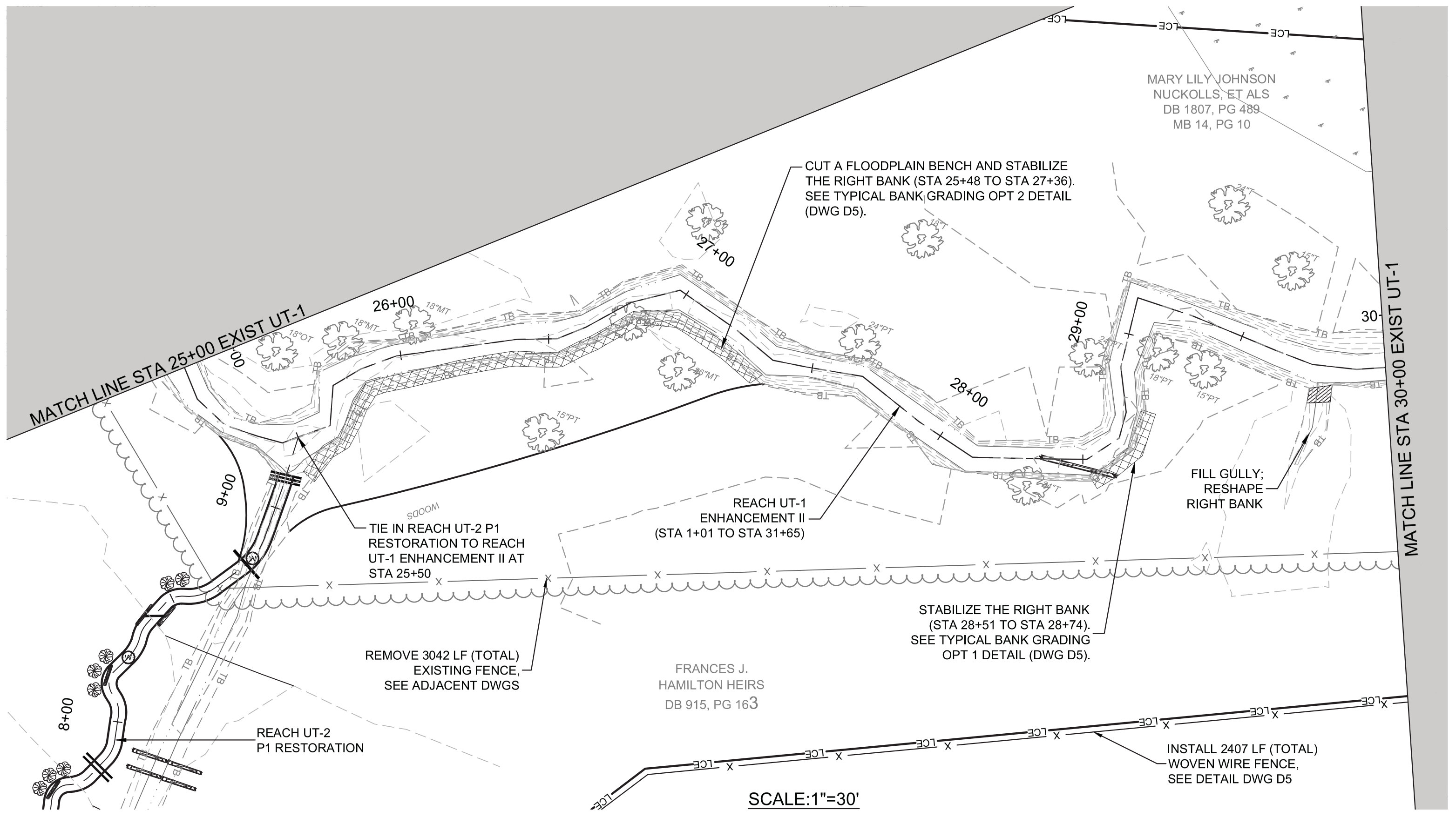
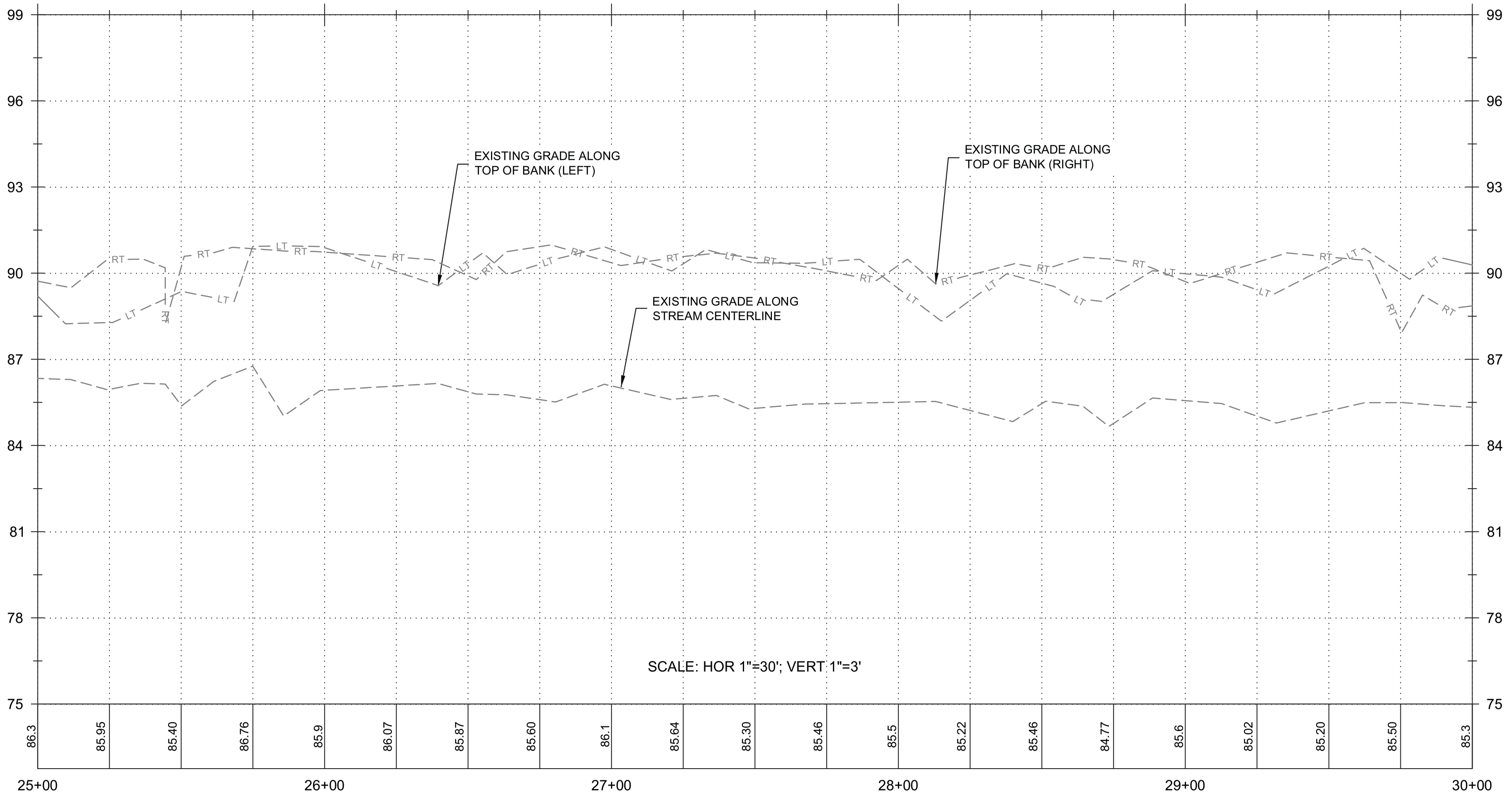


SCALE:1"=30'



SCALE: HOR 1"=30'; VERT 1"=3'

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5. ALL CUT PRIVET MUST BE REMOVED FROM THE EASEMENT AND DISPOSED OF OFF-SITE.
6. FOR PROPOSED ENHANCEMENT AND FLOODPLAIN GRADING, SEE TYPICAL BANK GRADING DETAILS ON SHEET D5.

NOTES:

1. IN GENERAL, STREAM CONSTRUCTION SHALL PROCEED FROM AN UPSTREAM TO DOWNSTREAM DIRECTION.
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LEGEND

EXISTING CONTOUR MAJOR	— — 50 — —
EXISTING CONTOUR MINOR	— — 46 — —
PROPOSED CONTOUR MAJOR	—— (50) ——
PROPOSED CONTOUR MINOR	—— (42) ——
EXISTING WETLAND	⬚
EXISTING TOP OF BANK	— — — TB —
EXISTING BOTTOM OF BANK	— — — BB —
PROPOSED CENTERLINE OF CHANNEL	—— · · ——
EXISTING FENCELINE	— — — X —
EXISTING TREELINE	⌒⌒⌒⌒
PROPOSED CHANNEL BOTTOM	═ ═ ═
PROPOSED TOP OF BANK	═══
LIMITS OF PROPOSED CONSERVATION EASEMENT	—— LCE ——
VEGETATED SILL (SEE DETAIL SHEET D2)	⌣
PROPOSED BANK STABILIZATION AREA	▨
PROPOSED WETLAND	▭
PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)	▨
CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)	✚
LARGE WOODY DEBRIS (SEE DETAIL DWG D4)	⬬
LEAF PACK (SEE DETAIL DWG D3)	🍁
SMALL WOODY DEBRIS (SEE DETAIL DWG D3)	Ⓦ
LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)	✿
EXISTING TREE	✿
LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)	≡
BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)	⫽
LOG TOE PROTECTION (SEE DETAIL DWG D2)	━
LOG STRUCTURE (SEE DETAIL DWG D4)	━
LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)	═
LOG VANE (SEE DETAIL DWG D2)	━
FLOODPLAIN SILL (SEE DETAIL DWG D4)	═
DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)	◁
LOG GRADE CONTROL (PROFILE)	○○
LOG STRUCTURE (PROFILE)	○○
BEDDED LOG STRUCTURE (PROFILE)	○

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EBX

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2" = FULL SCALE
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PLOT DATE:
4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:
RELEASED FOR:

PROJECT NAME: CEDAR CREEK STREAM AND
WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

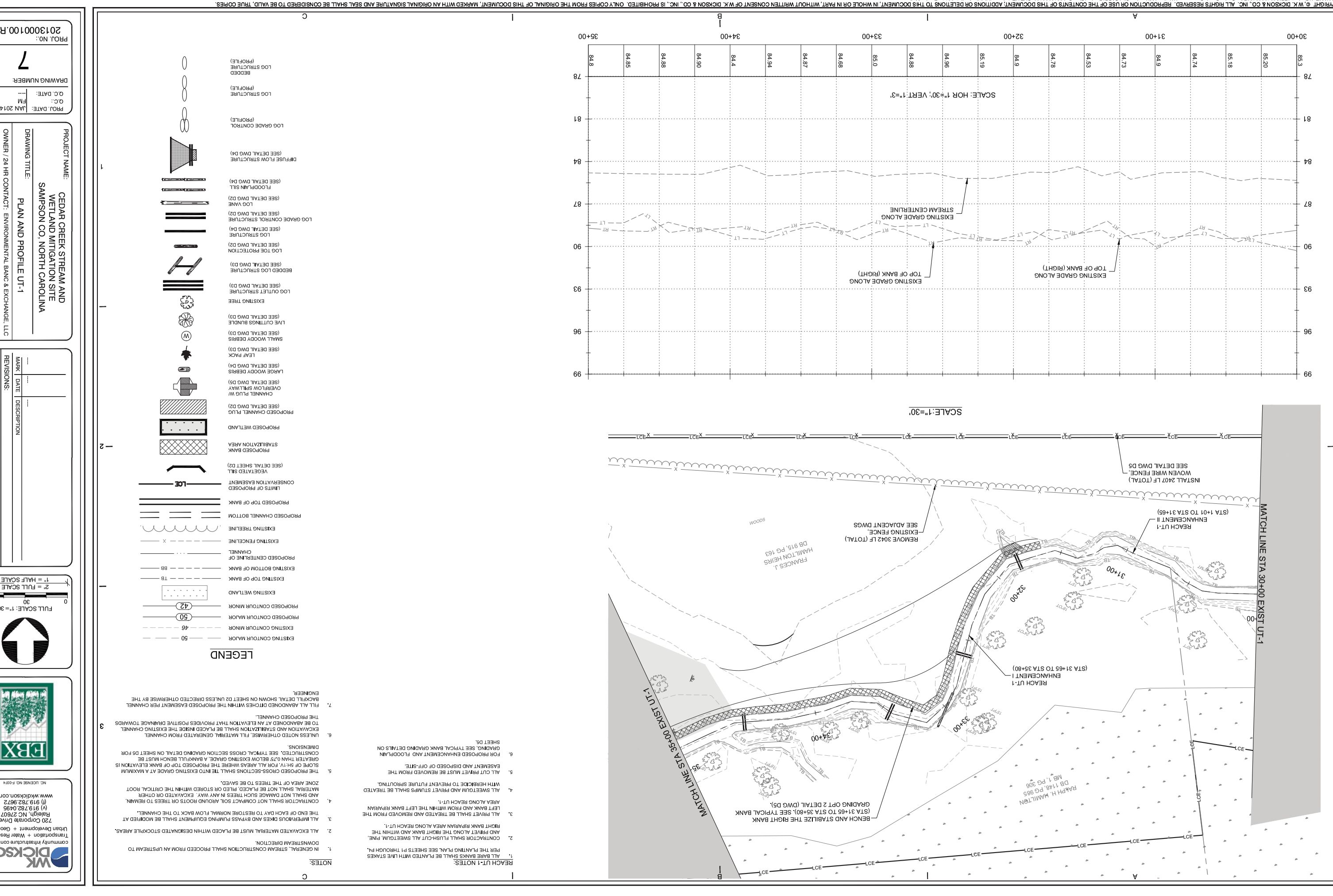
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ----

DRAWING NUMBER:
6

PROJ. NO.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen

FILE NAME: I:\Projects\EBX\20130001000 - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001000 SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen



REACH UT-1 NOTES:

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LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — (50)
- PROPOSED CONTOUR MINOR — (42)
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

FULL SCALE: 1"= 30

0 30 60

2" = FULL SCALE
1" = HALF SCALE

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NC. LICENSE NO. F-0224

EBX

PLOT DATE: 4/4/2014

REVISIONS:

MARK	DATE	DESCRIPTION
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RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

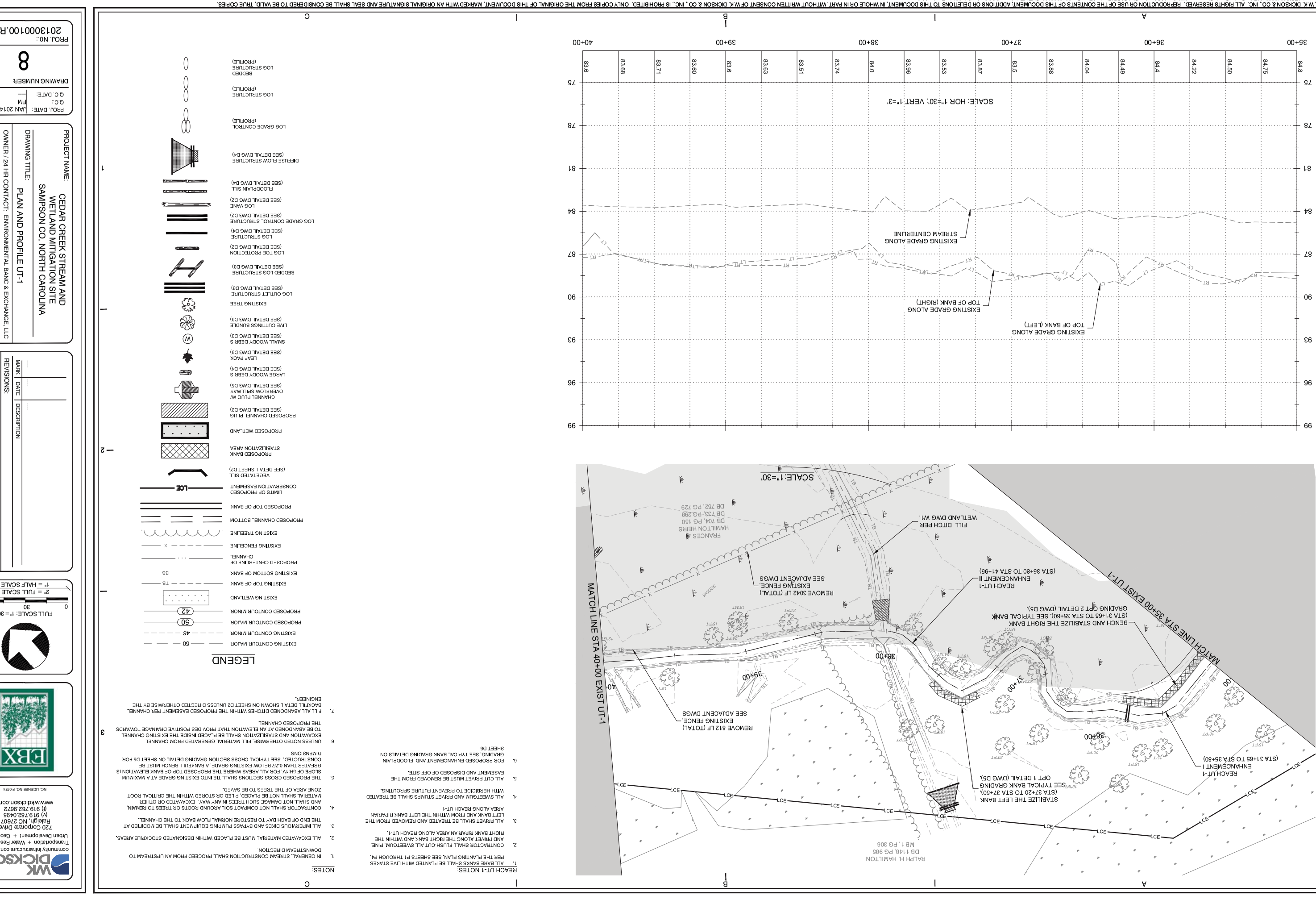
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
D.G.: FM
D.G. DATE: --

DRAWING NUMBER:
7

PROJ. NO.:
20130001000.RA

FILE NAME: I:\Projects\EBX\20130001000\Site\CADD\Design\Plan Set\20130001000 SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen



LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — 50
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
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- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
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- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

NOTES:

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PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE:	JAN 2014
D.G.:	FM
D.G. DATE:	--

DRAWING NUMBER: 8

PROJ. NO.: 20130001000.RA

REVISIONS:			
MARK	DATE	DESCRIPTION	
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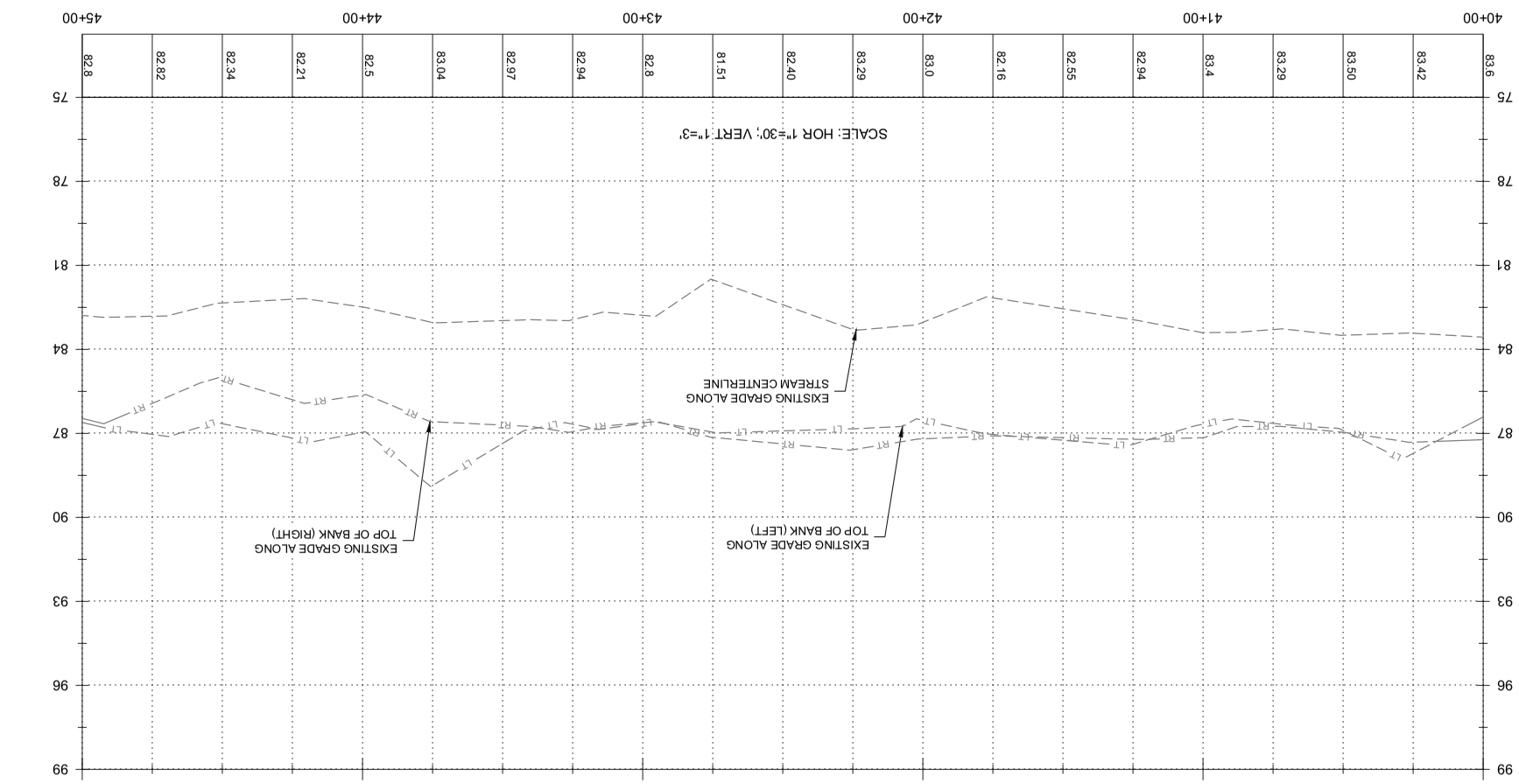
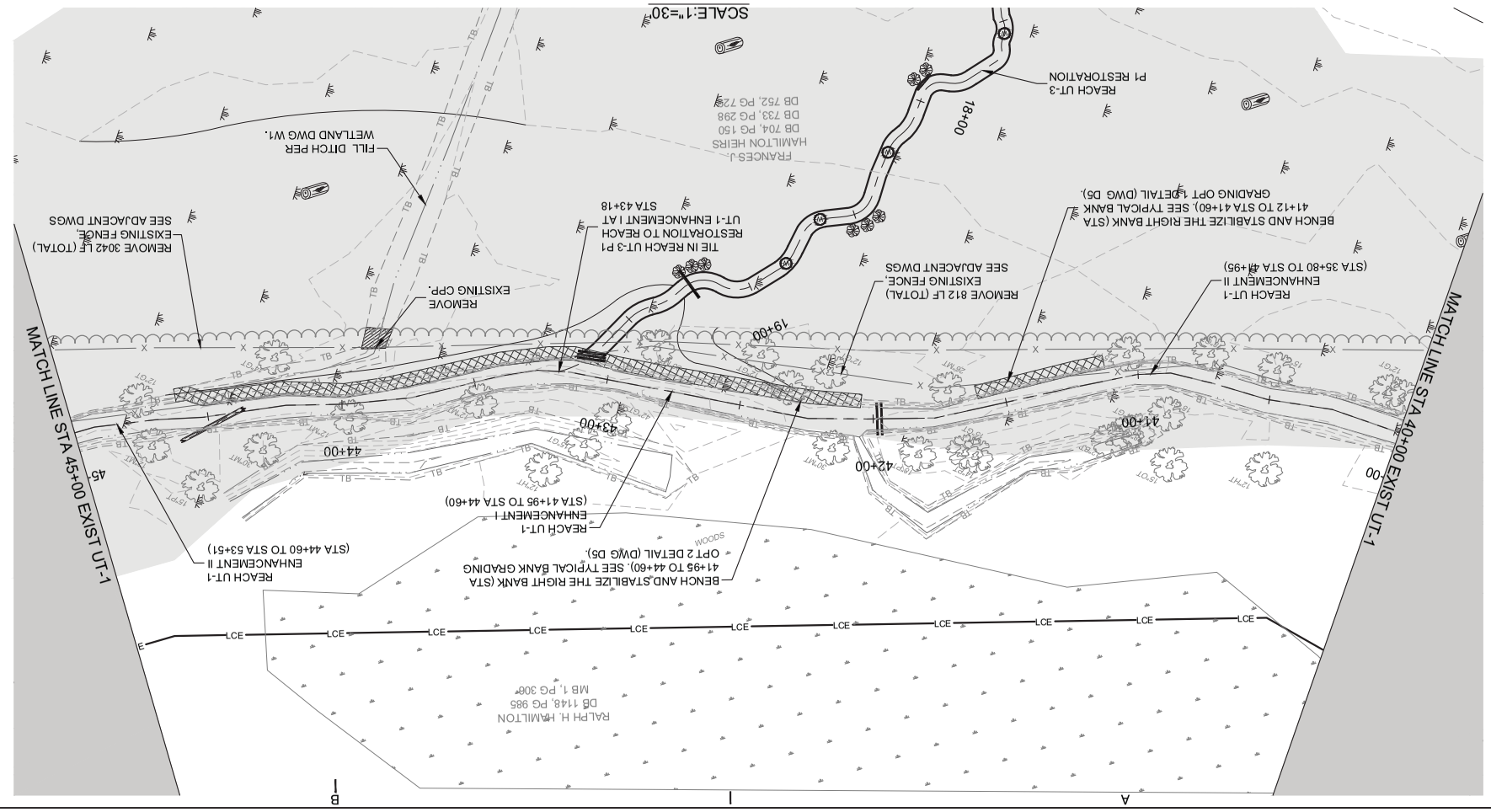
RELEASED FOR: ----

FILE NAME: I:\Projects\EBX\20130001000\Design\Plan Set\20130001000 SHT UT-1.dwg -#### - April 4, 2014 - Fraser Mullen





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FULL SCALE: 1"= 30
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1" = HALF SCALE

PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
9

PROJ. NO.:: 20130001000.RA

MARK	DATE	DESCRIPTION
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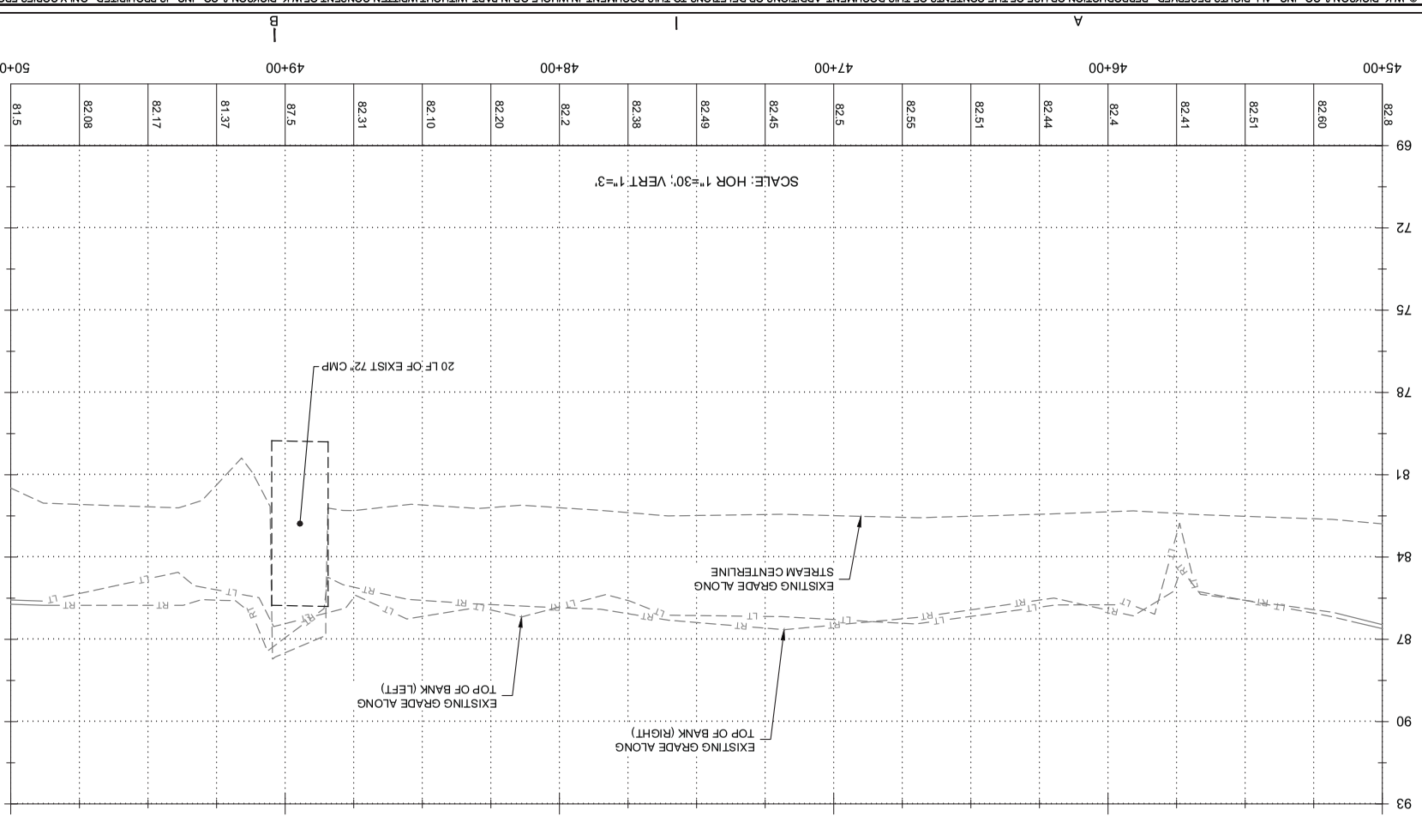
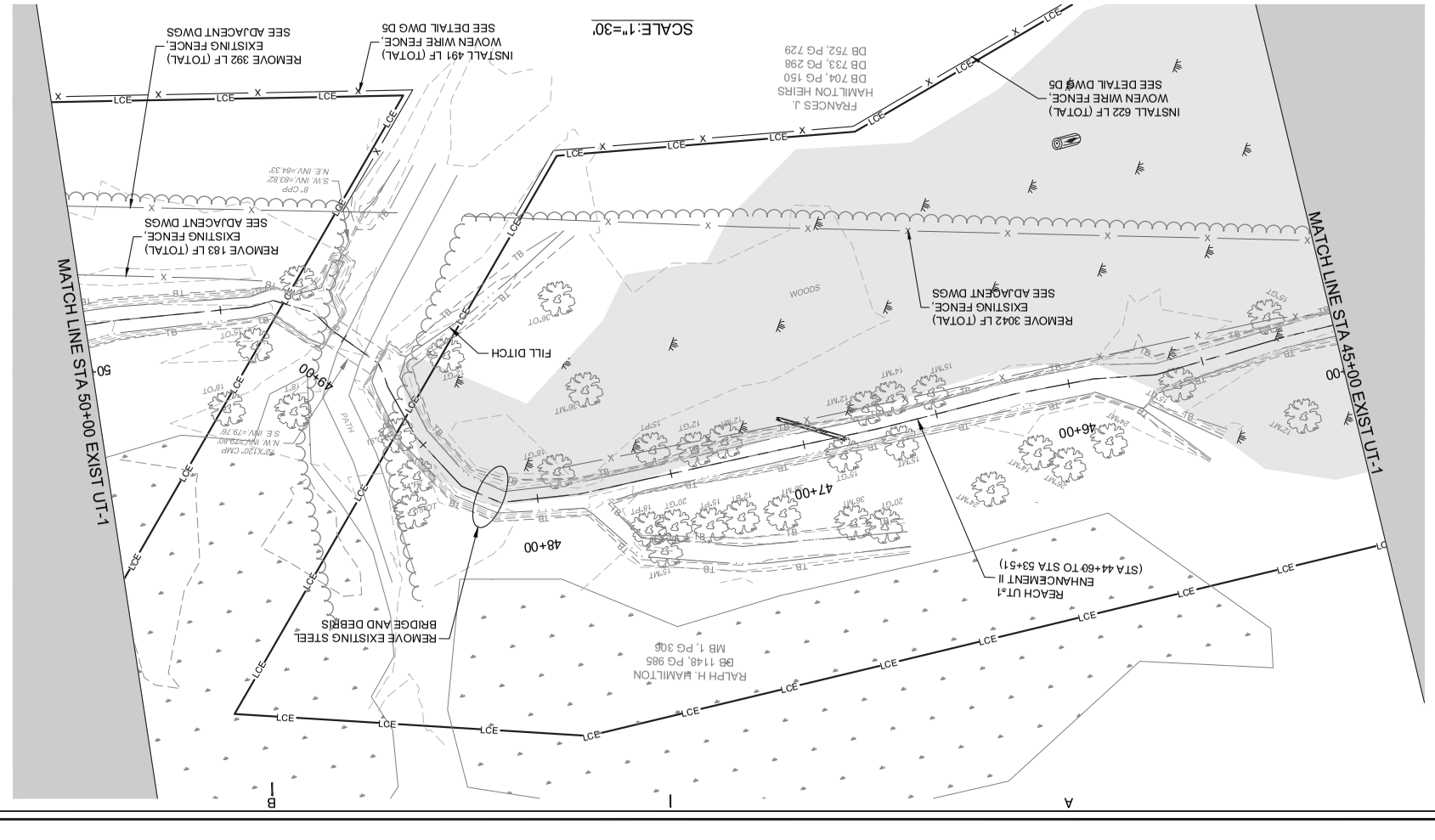
REVISIONS:

RELEASED FOR:

FILE NAME: I:\Projects\EBX\20130001000RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001000 SHT UT-1.dwg -####- April 4, 2014 - Frasier Mullen





REACH UT-1 NOTES:

1. ALL BARE BANKS SHALL BE PLANTED WITH LIVE STAKES PER THE PLANTING PLAN, SEE SHEETS P1 THROUGH P4.
2. CONTRACTOR SHALL FLUSH-CUT ALL SWEETGUM PNE. AND PRIVET ALONG THE RIGHT BANK AND WITHIN THE RIGHT BANK RIPARIAN AREA ALONG REACH UT-1.
3. ALL PRIVET SHALL BE TREATED AND REMOVED FROM THE LEFT BANK AND FROM WITHIN THE LEFT BANK RIPARIAN AREA ALONG REACH UT-1.
4. ALL SWEETGUM AND PRIVET STUMPS SHALL BE TREATED WITH HERBICIDE TO PREVENT FUTURE SPROUTING.
5. ALL CUT PRIVET MUST BE REMOVED FROM THE EASEMENT AND DISPOSED OF OFF-SITE.
6. FOR PROPOSED ENHANCEMENT AND FLOODPLAIN GRADING, SEE TYPICAL BANK GRADING DETAILS ON SHEET D5.

NOTES:

1. IN GENERAL, STREAM CONSTRUCTION SHALL PROCEED FROM AN UPSTREAM TO DOWNSTREAM DIRECTION.
2. ALL IMPERVIOUS MATERIAL MUST BE PLACED WITHIN DESIGNATED STOCKPILE AREAS.
3. ALL IMPERVIOUS DIKES AND BYPASS PUMPING EQUIPMENT SHALL BE MODIFIED AT THE END OF EACH DAY TO RESTORE NORMAL FLOW BACK TO THE CHANNEL.
4. CONTRACTOR SHALL NOT COMPACT SOIL AROUND ROOTS OR TREES TO REMAIN. AND SHALL NOT DAMAGE SUCH TREES IN ANY WAY. EXCAVATED OR OTHER MATERIAL SHALL NOT BE PLACED, PILED OR STORED WITHIN THE CRITICAL ROOT ZONE AREA OF THE TREES TO BE SAVED.
5. THE PROPOSED CROSS-SECTIONS SHALL TIE INTO EXISTING GRADE AT A MAXIMUM SLOPE OF 3H:1V, FOR ALL AREAS WHERE THE PROPOSED TOP OF BANK ELEVATION IS GREATER THAN 0.75' BELOW EXISTING GRADE. A BANKFULL BENCH MUST BE CONSTRUCTED. SEE TYPICAL CROSS SECTION GRADING DETAIL ON SHEET D5 FOR DIMENSIONS.
6. UNLESS NOTED OTHERWISE, FILL MATERIAL GENERATED FROM CHANNEL EXCAVATION AND STABILIZATION SHALL BE PLACED INSIDE THE EXISTING CHANNEL TO BE ABANDONED AT AN ELEVATION THAT PROVIDES POSITIVE DRAINAGE TOWARDS THE PROPOSED CHANNEL.
7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — 50
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

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NC LICENSE NO. F-0374

EBX

PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE:	JAN 2014
Q.C.:	FM
Q.C. DATE:	---

DRAWING NUMBER: 10

PROJ. NO.: 20130001000.RA

MARK	DATE	DESCRIPTION
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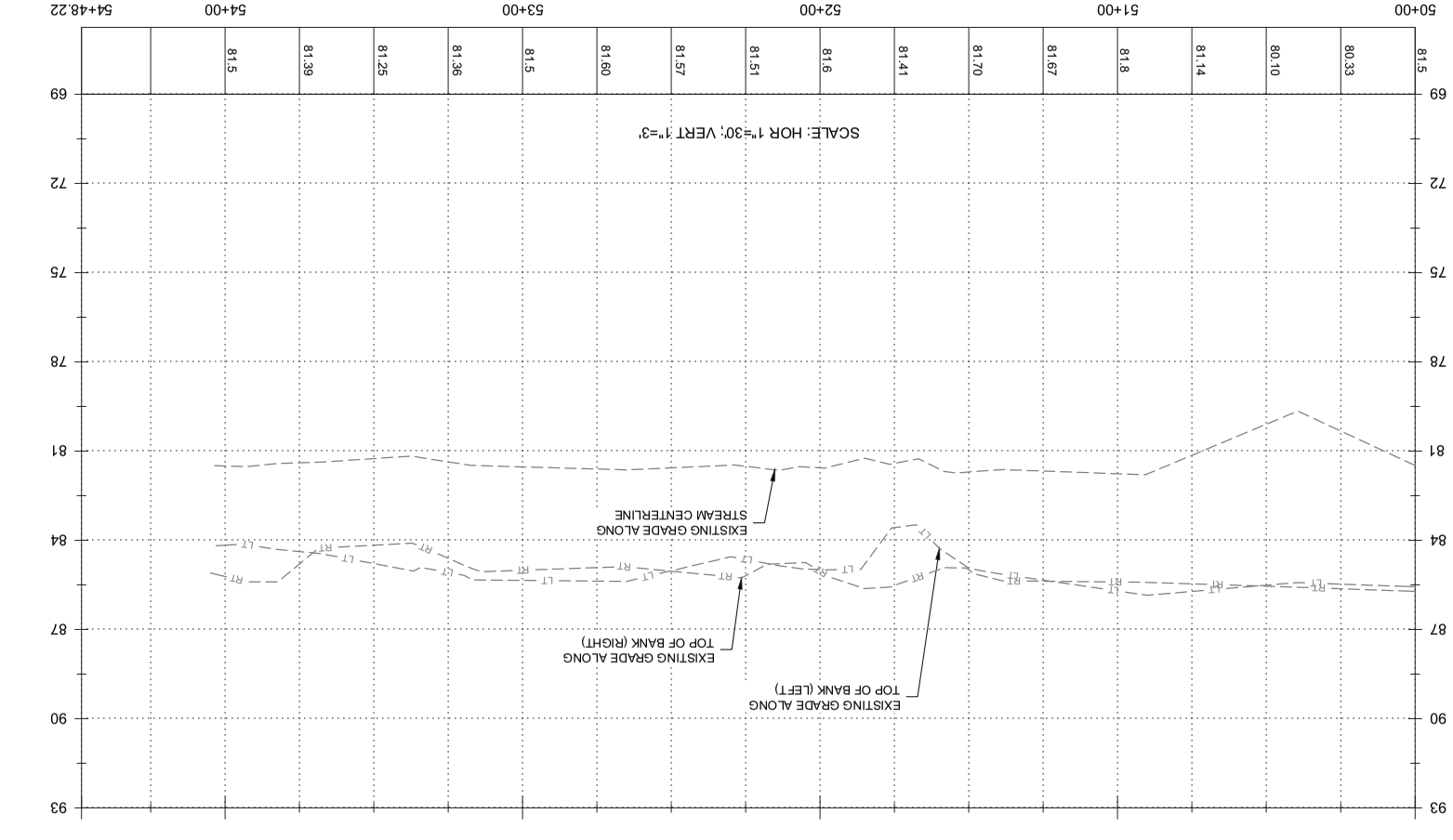
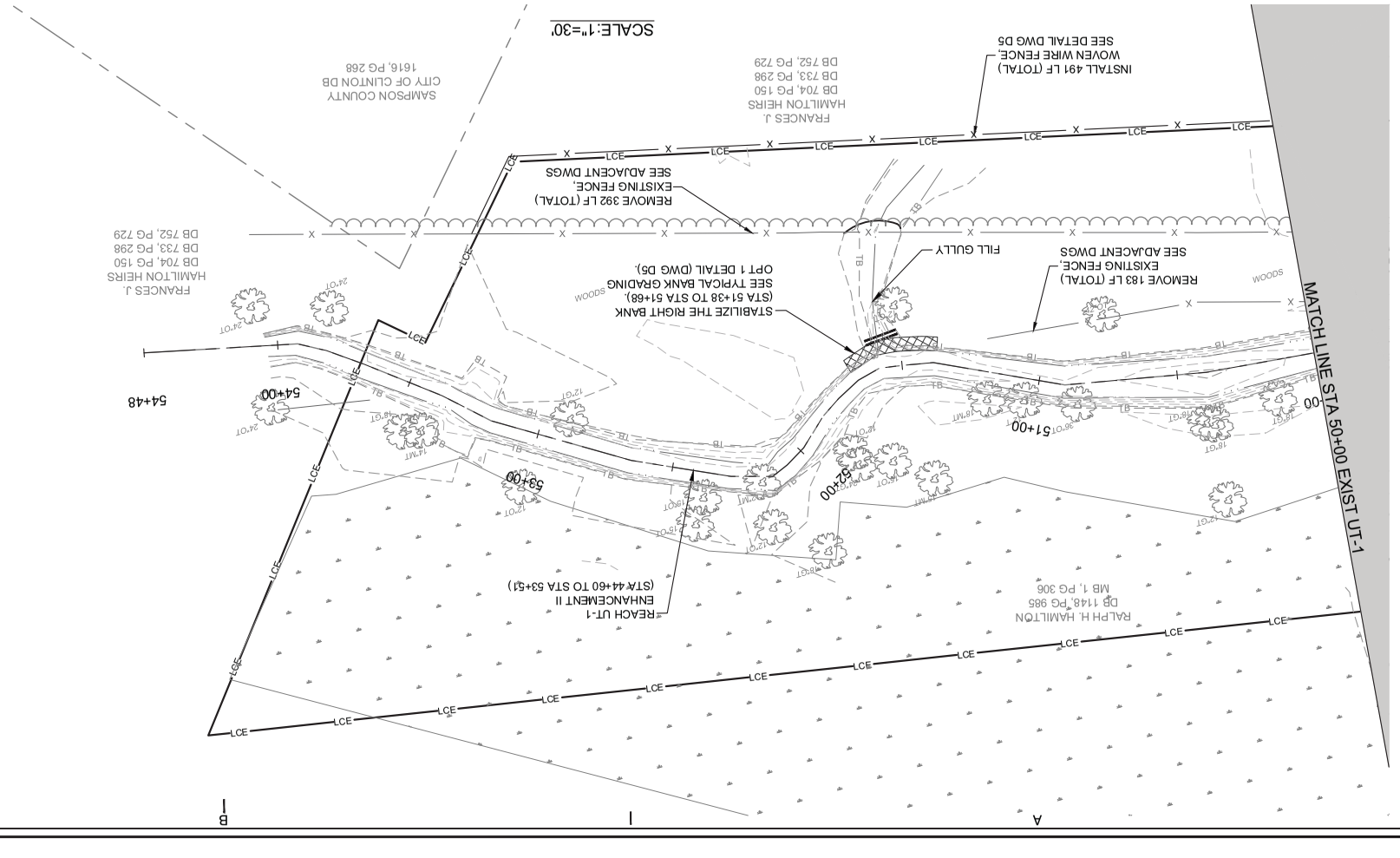
REVISIONS:

RELEASED FOR:

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

FILE NAME: I:\Projects\EBX\20130001\00A - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001 SHT UT-1.dwg -#### - April 4, 2014 - Frasier Mullen





REACH UT-1 NOTES:

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NOTES:

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7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — (50)
- PROPOSED CONTOUR MINOR — (42)
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
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- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

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(f) 919.782.9672
www.wkdickson.com
NC LICENSE NO. F-0374

PLOT DATE: 4/4/2014

NO.	MARK	DATE	DESCRIPTION

REVISIONS:

RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO., NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-1

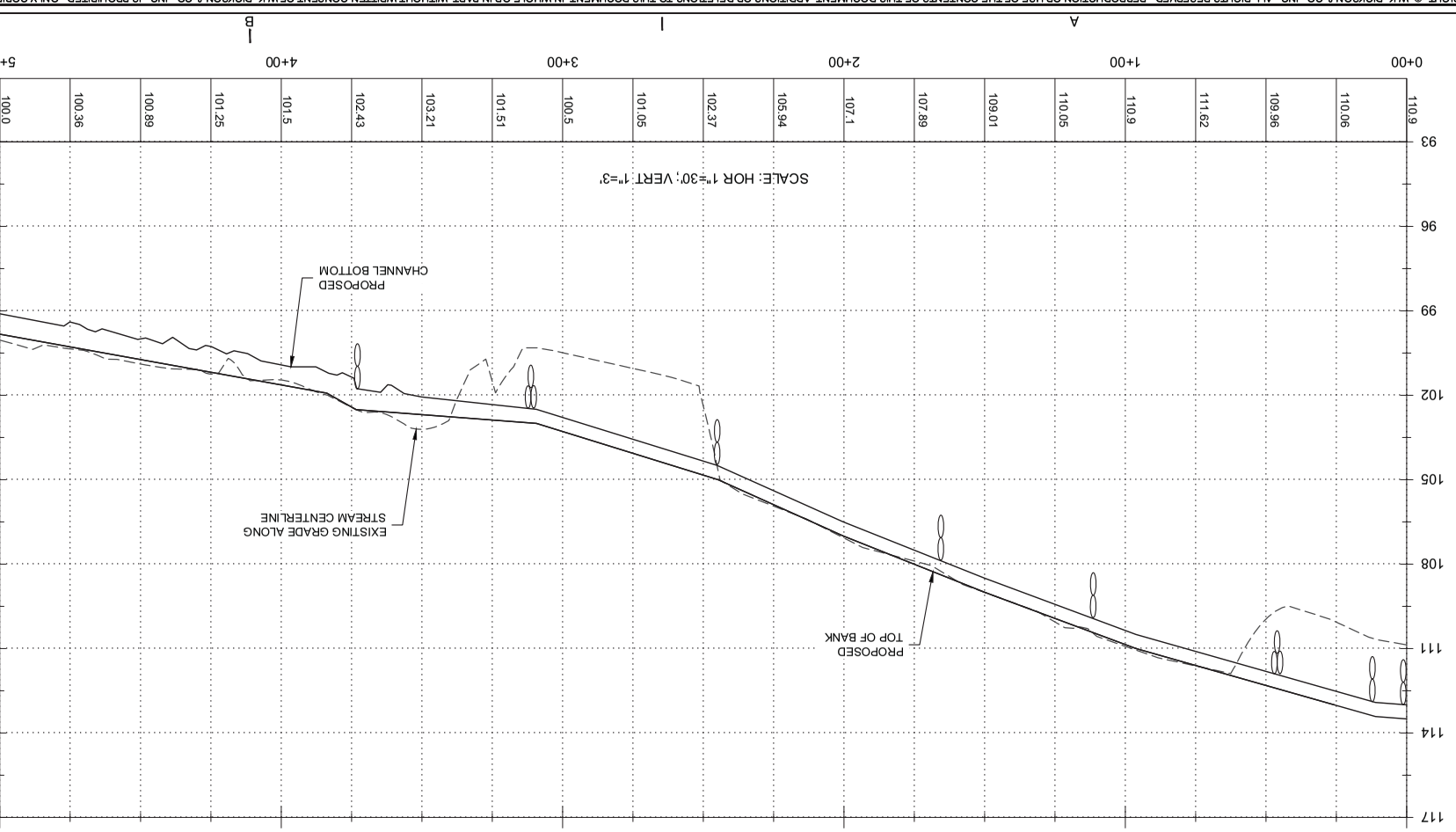
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

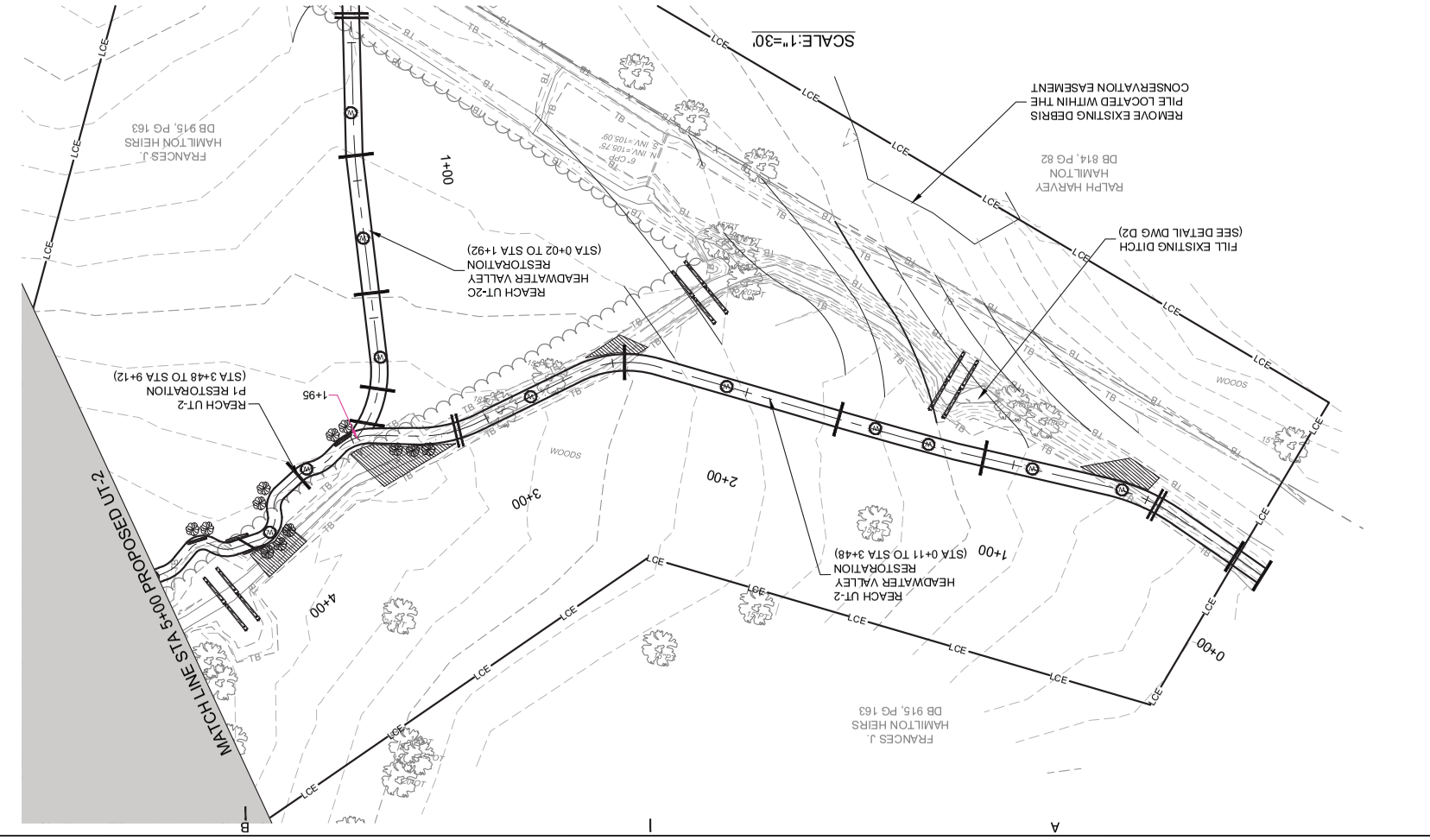
PROJ. DATE: April 2012
D.C.: ---
G.C. DATE: GF

DRAWING NUMBER:
11

PROJ. NO.:
20130001.00.RA

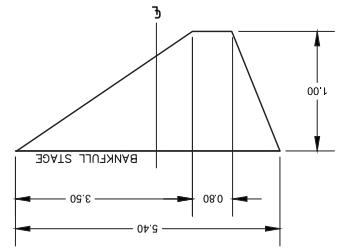
FILE NAME: I:\Projects\EBX\20130001000A - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001000 SHT UT-2.dwg -#### - April 4, 2014 - Fraisier Mullen



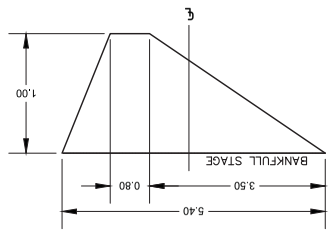


TYPICAL LEFT MEANDER CROSS SECTION

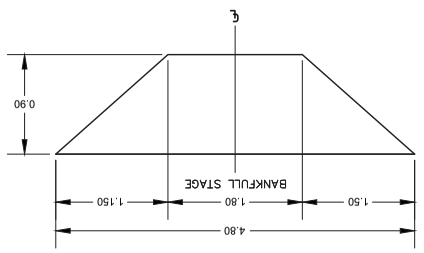
STA 3+48 TO STA 9+12



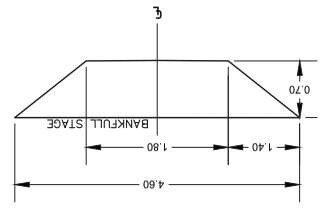
TYPICAL RIGHT MEANDER CROSS SECTION



TYPICAL POOL CROSS SECTION STRAIGHT REACH

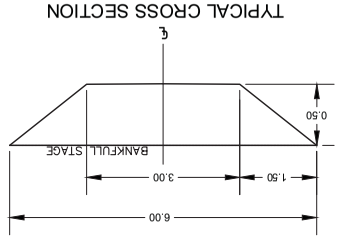


TYPICAL SHALLOW CROSS SECTION



STA 0+11 TO STA 3+48

TYPICAL CROSS SECTION



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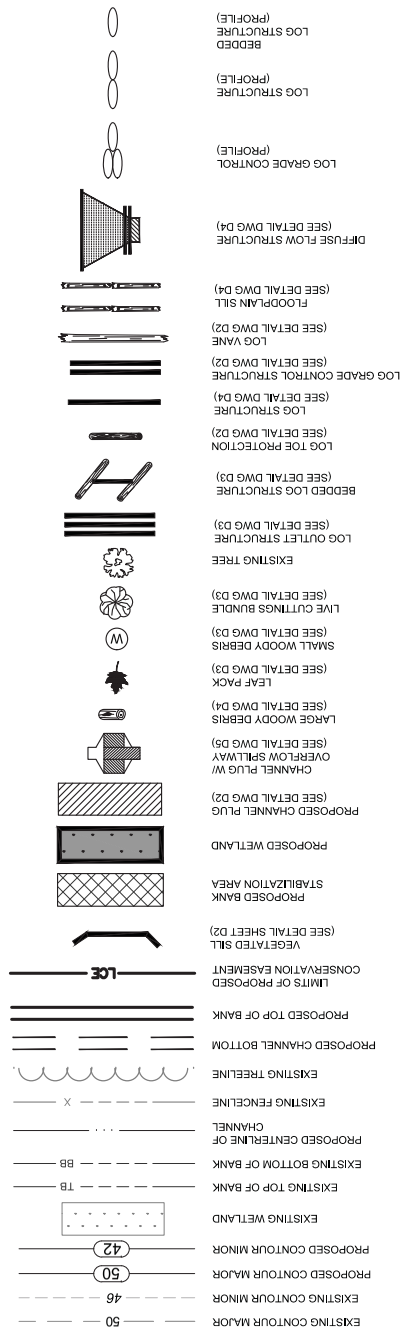

NOTES:

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2. ALL EXCAVATED MATERIAL MUST BE PLACED WITHIN DESIGNATED STOCKPILE AREAS.
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NC. LICENSE NO. F-0374

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

REVISIONS:			
MARK	DATE	DESCRIPTION	
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RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

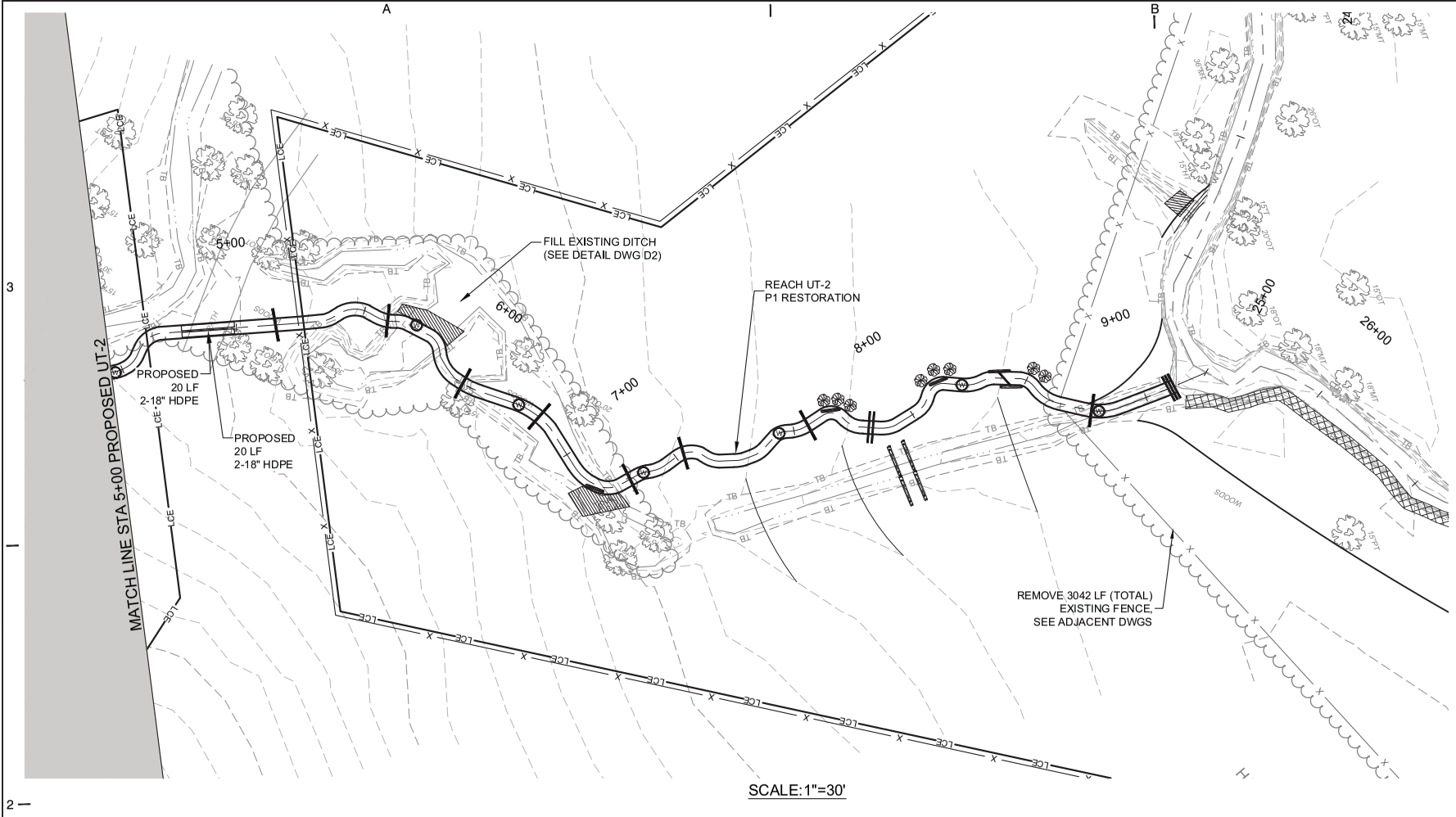
DRAWING TITLE:
PLAN AND PROFILE UT-2

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
12

PROJ. NO.:
20130001.00.RA



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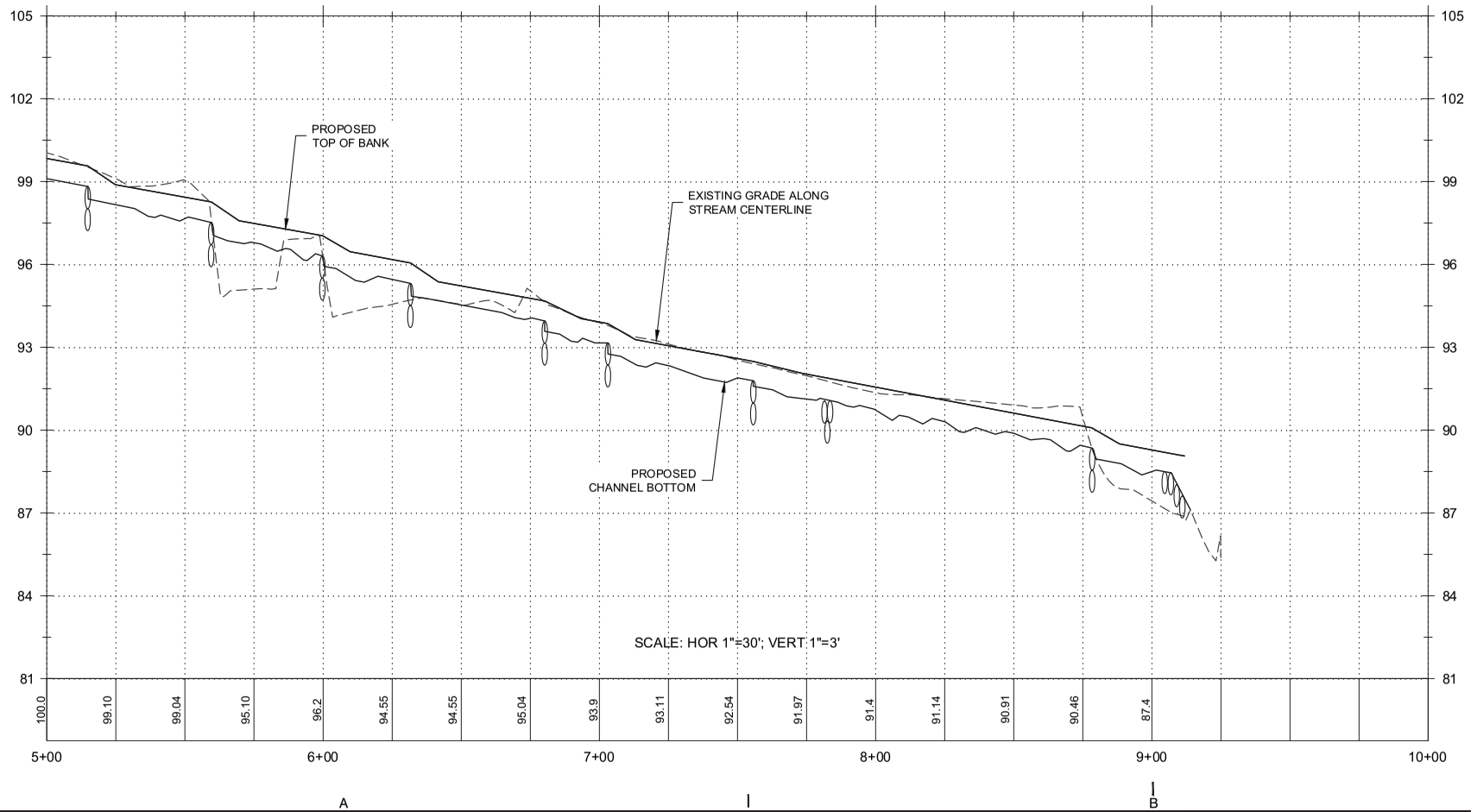
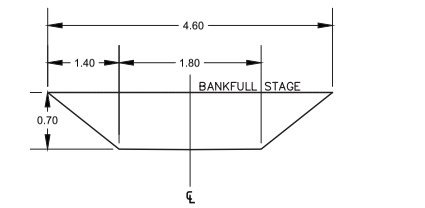
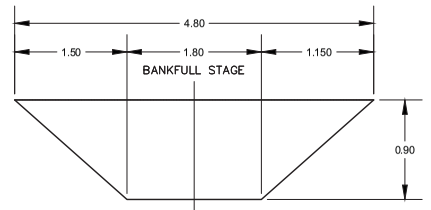


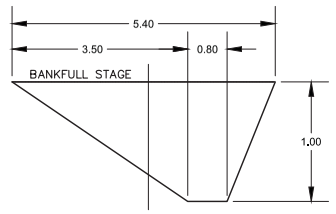
SCALE: HOR 1"=30'; VERT 1"=3'



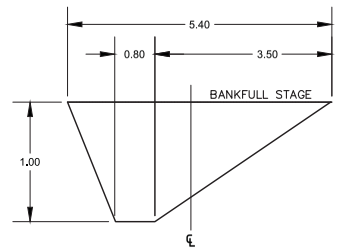
TYPICAL SHALLOW CROSS SECTION



TYPICAL POOL CROSS SECTION
STRAIGHT REACH



TYPICAL RIGHT MEANDER CROSS SECTION



TYPICAL LEFT MEANDER CROSS SECTION

NOTES:

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LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — 50
- PROPOSED CONTOUR MINOR — 42
- EXISTING WETLAND
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- PROPOSED CHANNEL BOTTOM
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- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
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2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLAN AND PROFILE UT-2

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

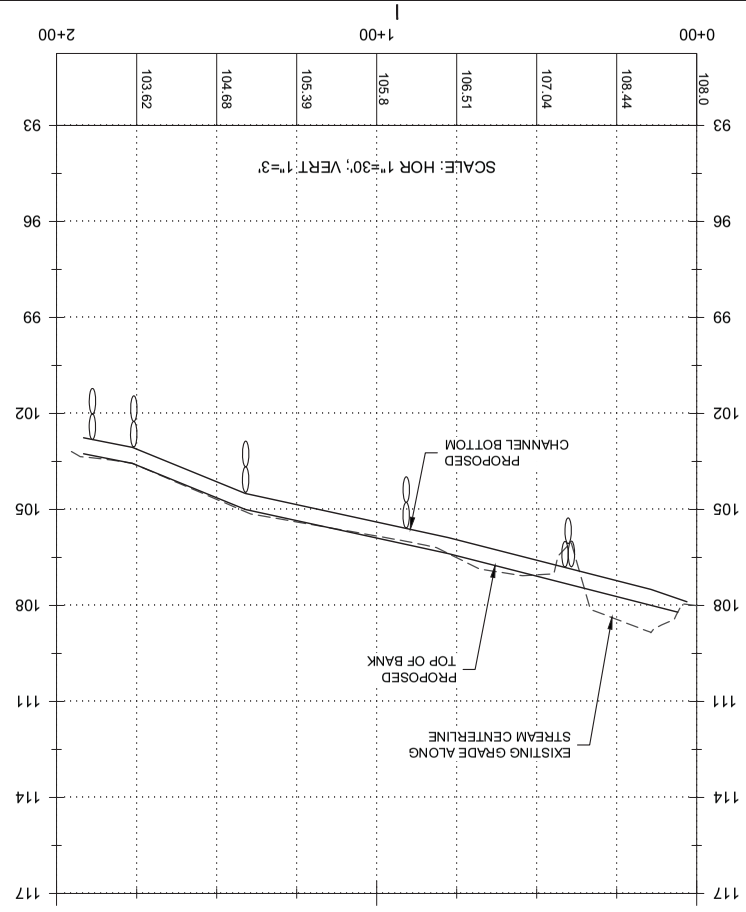
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

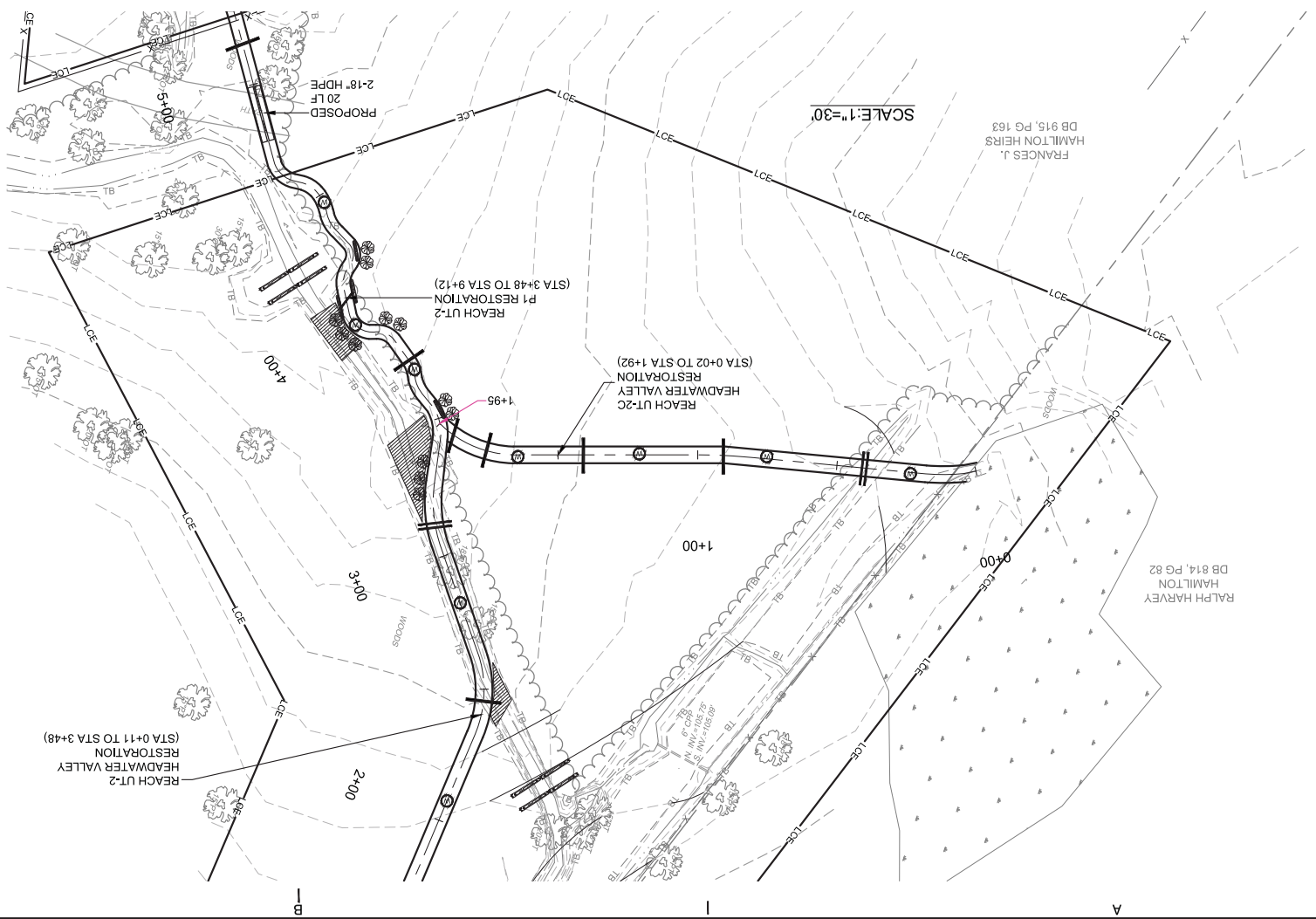
DRAWING NUMBER:
13

PROJ. N0.:
2013000100.RA

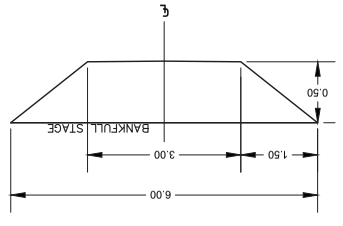
FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT UT-2.dwg -#### - April 4, 2014 - Frasier Mullen

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001 00. SHT UT-2.dwg -#### - April 4, 2014 - Frasier Mullen

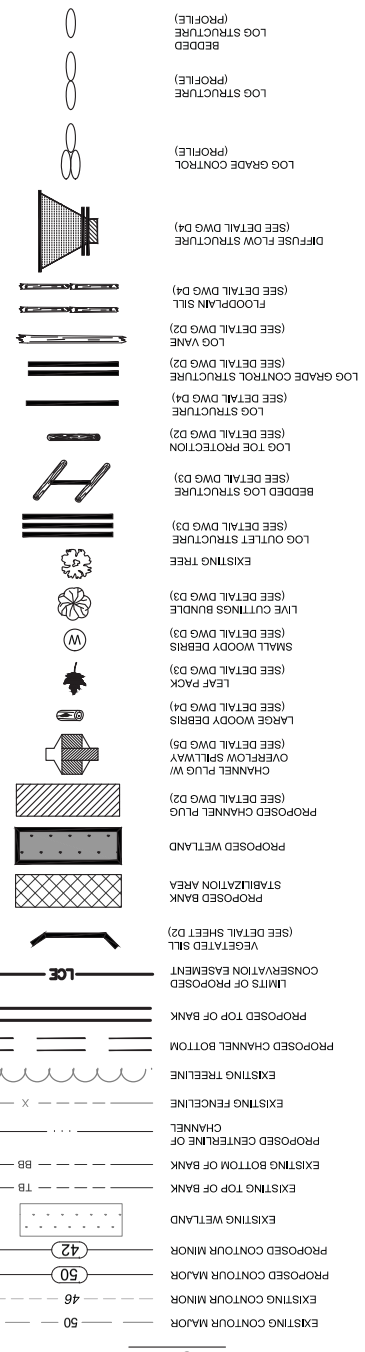




TYPICAL CROSS SECTION



LEGEND



NOTES:

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NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-2C

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: --

DRAWING NUMBER:
14

PROJ. NO.:
20130001 00.RA

REVISIONS:			
MARK	DATE	DESCRIPTION	
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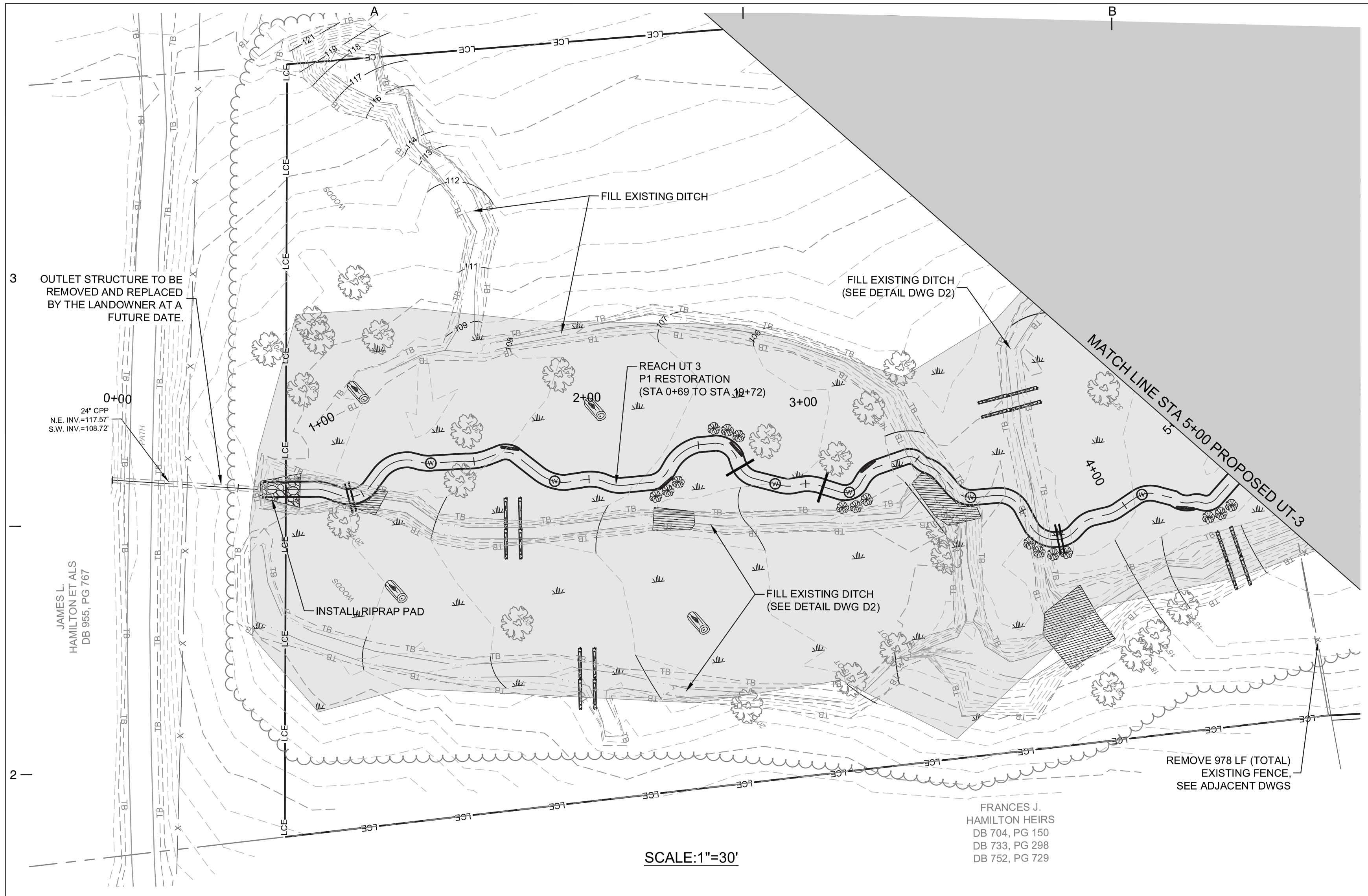
RELEASED FOR:

PLOT DATE:
4/4/2014



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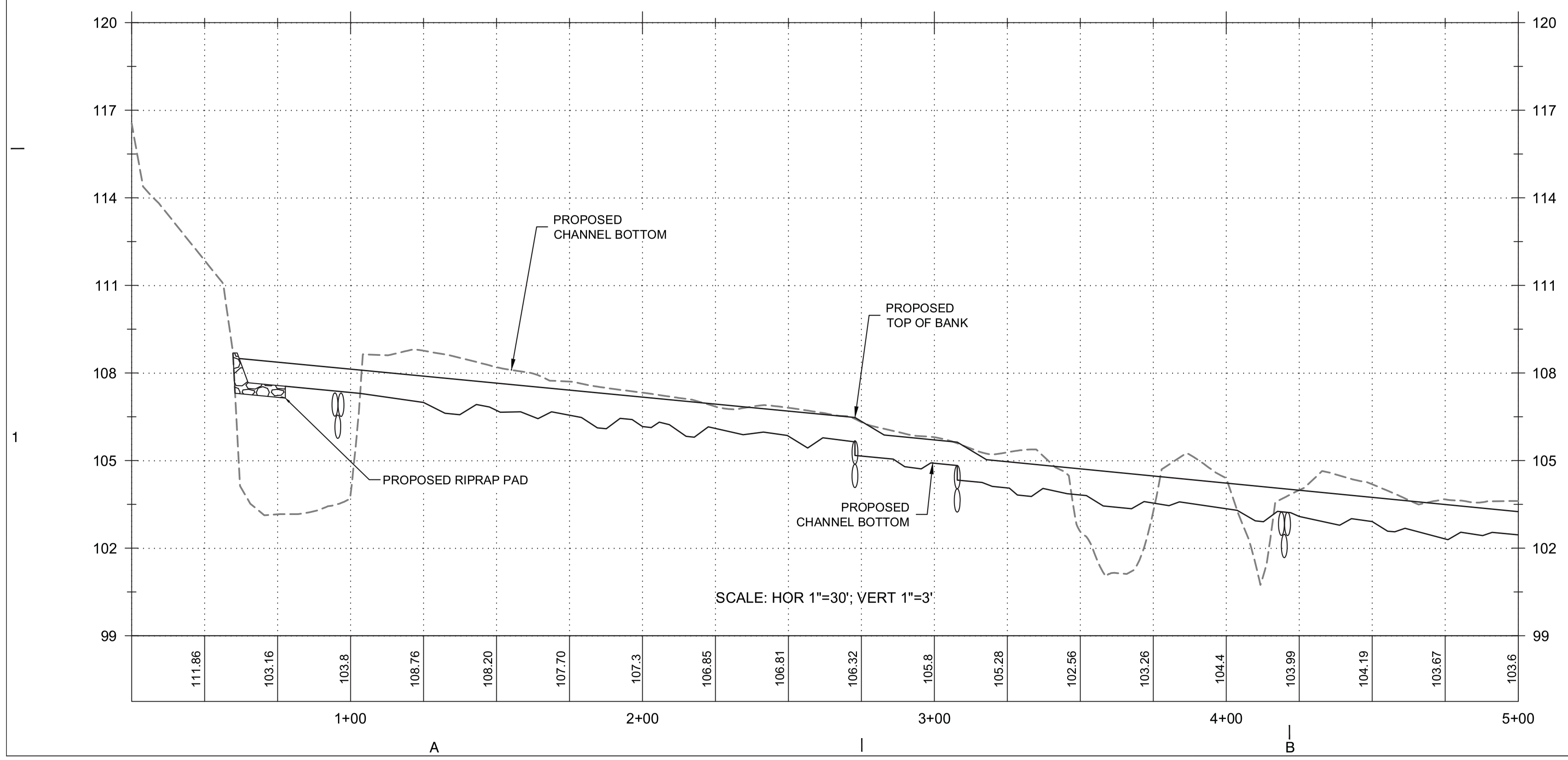
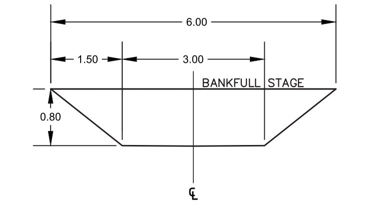
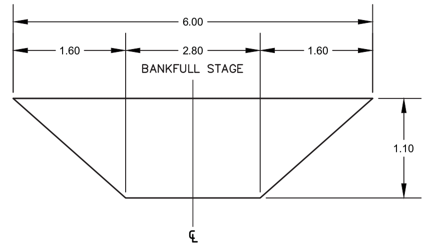


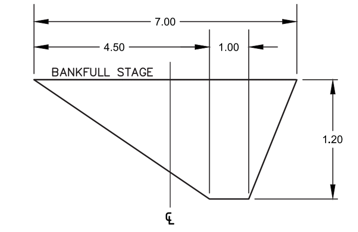
SCALE: HOR 1"=30'; VERT 1"=3'



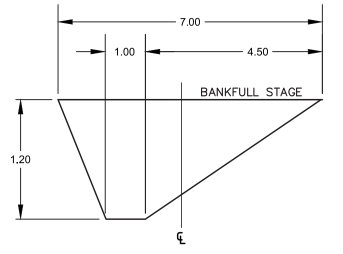
TYPICAL SHALLOW CROSS SECTION



TYPICAL POOL CROSS SECTION
STRAIGHT REACH



TYPICAL RIGHT MEANDER CROSS SECTION



TYPICAL LEFT MEANDER CROSS SECTION

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LEGEND

EXISTING CONTOUR MAJOR	— — 50 — —
EXISTING CONTOUR MINOR	— — 46 — —
PROPOSED CONTOUR MAJOR	—(50)—
PROPOSED CONTOUR MINOR	—(42)—
EXISTING WETLAND	⬚
EXISTING TOP OF BANK	— — — TB
EXISTING BOTTOM OF BANK	— — — BB
PROPOSED CENTERLINE OF CHANNEL	— · · —
EXISTING FENCELINE	— — X
EXISTING TREELINE	⌒⌒⌒⌒
PROPOSED CHANNEL BOTTOM	═ ═ ═
PROPOSED TOP OF BANK	═══
LIMITS OF PROPOSED CONSERVATION EASEMENT	—LCE—
VEGETATED SILL (SEE DETAIL SHEET D2)	⌣
PROPOSED BANK STABILIZATION AREA	▨
PROPOSED WETLAND	■
PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)	▨
CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)	✚
LARGE WOODY DEBRIS (SEE DETAIL DWG D4)	⬭
LEAF PACK (SEE DETAIL DWG D3)	🍁
SMALL WOODY DEBRIS (SEE DETAIL DWG D3)	Ⓦ
LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)	✿
EXISTING TREE	✿
LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)	≡
BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)	⧸─⧸
LOG TOE PROTECTION (SEE DETAIL DWG D2)	▬
LOG STRUCTURE (SEE DETAIL DWG D4)	━
LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)	═
LOG VANE (SEE DETAIL DWG D2)	━
FLOODPLAIN SILL (SEE DETAIL DWG D4)	━
DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)	◺
LOG GRADE CONTROL (PROFILE)	0 0 0
LOG STRUCTURE (PROFILE)	0 0
BEDDED LOG STRUCTURE (PROFILE)	0

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MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PLOT DATE:
4/4/2014

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLAN AND PROFILE UT-3

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

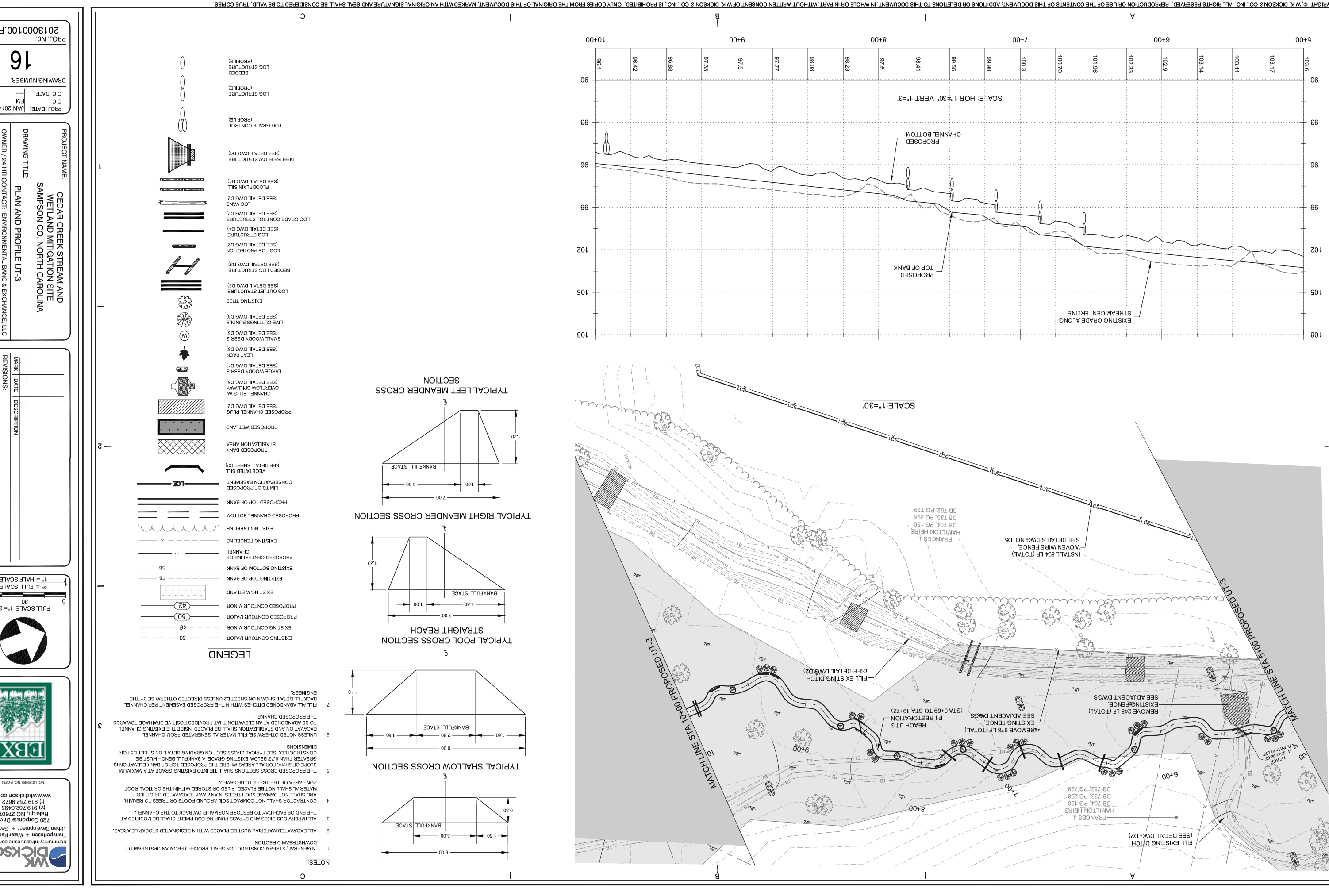
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ----

DRAWING NUMBER:
15

PROJ. NO.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT UT-3.dwg -#### - April 4, 2014 - Frasier Mullen

FILE NAME: I:\Projects\EBX\20130001000\Design\Plan Set\20130001000 SHT UT-3.dwg -#### - April 4, 2014 - Fraser Mullen



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LEGEND

- EXISTING CONTOUR MAJOR — 50
- EXISTING CONTOUR MINOR — 46
- PROPOSED CONTOUR MAJOR — (50)
- PROPOSED CONTOUR MINOR — (42)
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB
- EXISTING BOTTOM OF BANK — BB
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
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EBX

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0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-3

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
16

PROJ. NO.:
20130001000.RA

REVISIONS:

MARK	DATE	DESCRIPTION
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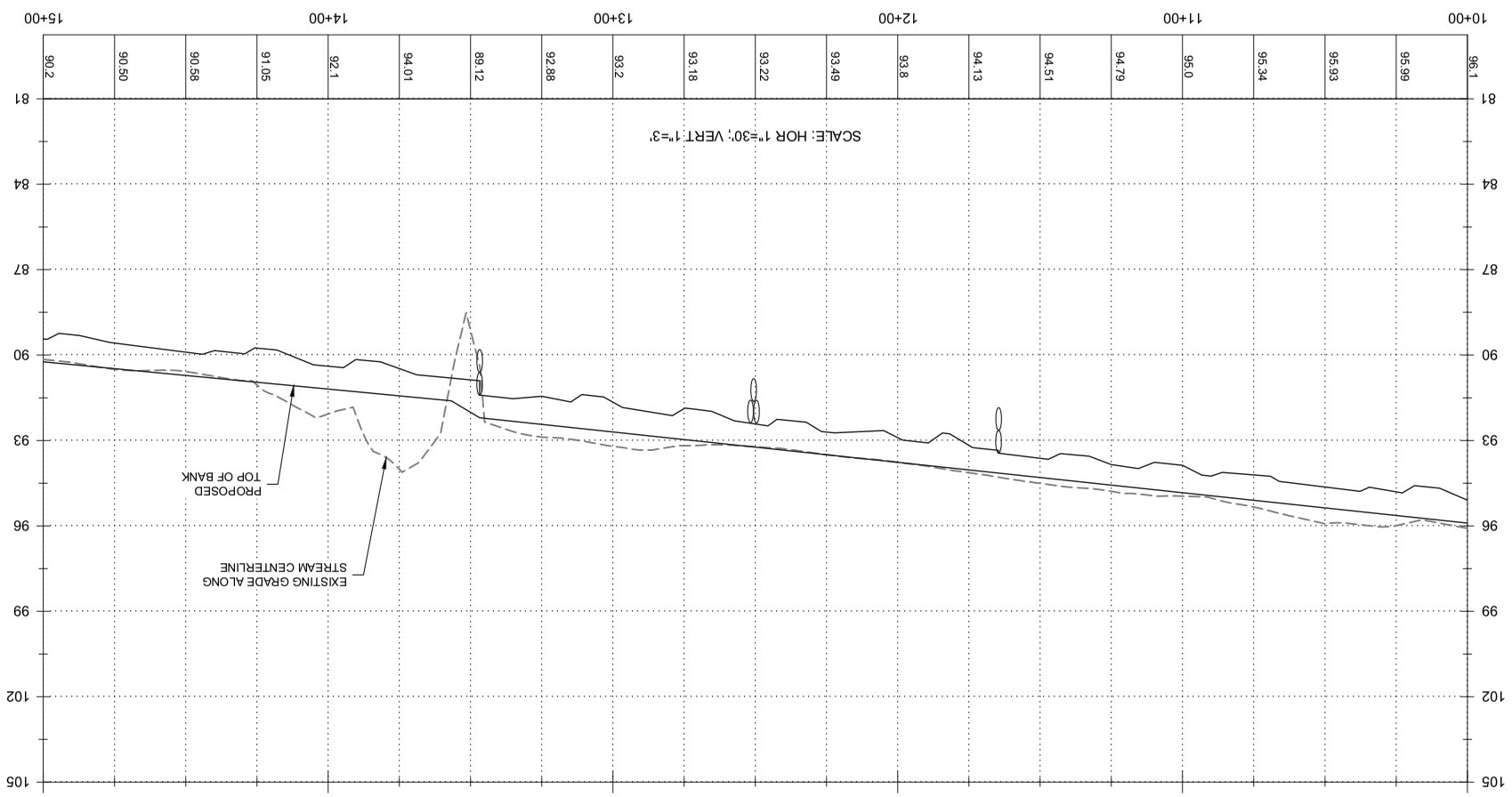
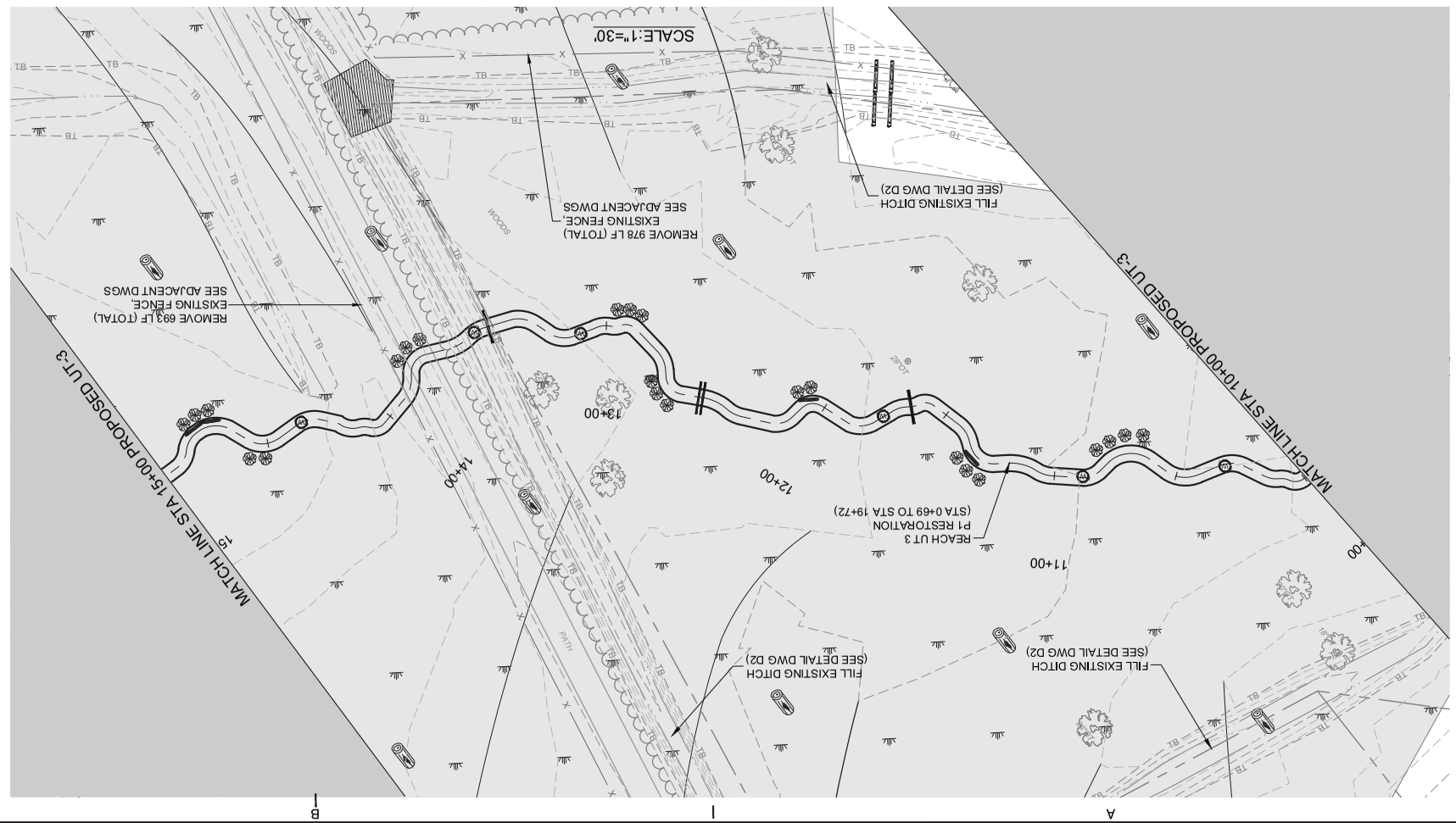
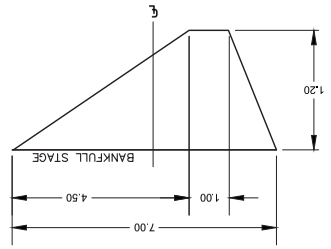
RELEASED FOR:

FILE NAME: I:\Projects\EBX\20130001000\Site(CADD)\Design\Plan Set\20130001000 SHT UT-3.dwg -#### - April 4, 2014 - Frasier Mullen

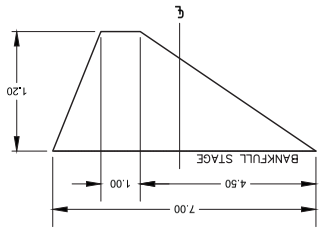




TYPICAL LEFT MEANDER CROSS SECTION

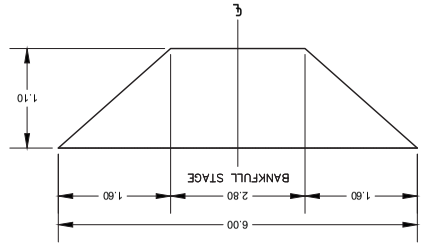


TYPICAL RIGHT MEANDER CROSS SECTION

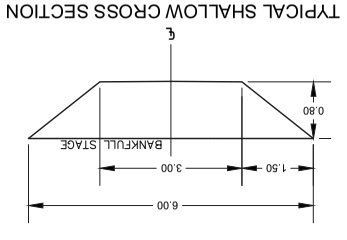


TYPICAL POOL CROSS SECTION

STRAIGHT REACH



TYPICAL SHALLOW CROSS SECTION



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PLOT DATE: 4/4/2014

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REVISIONS:

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PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO. NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-3

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
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DRAWING NUMBER:
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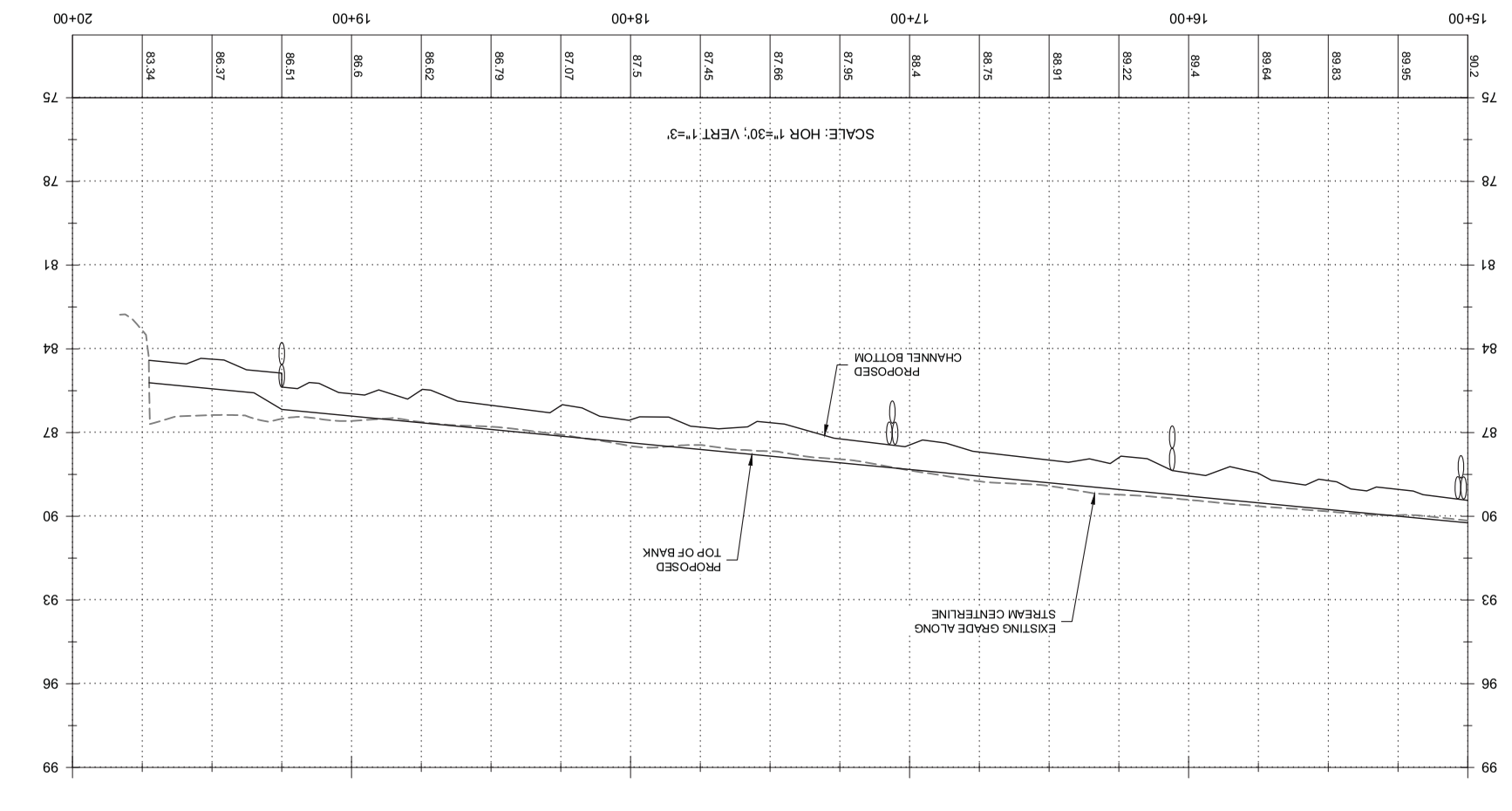

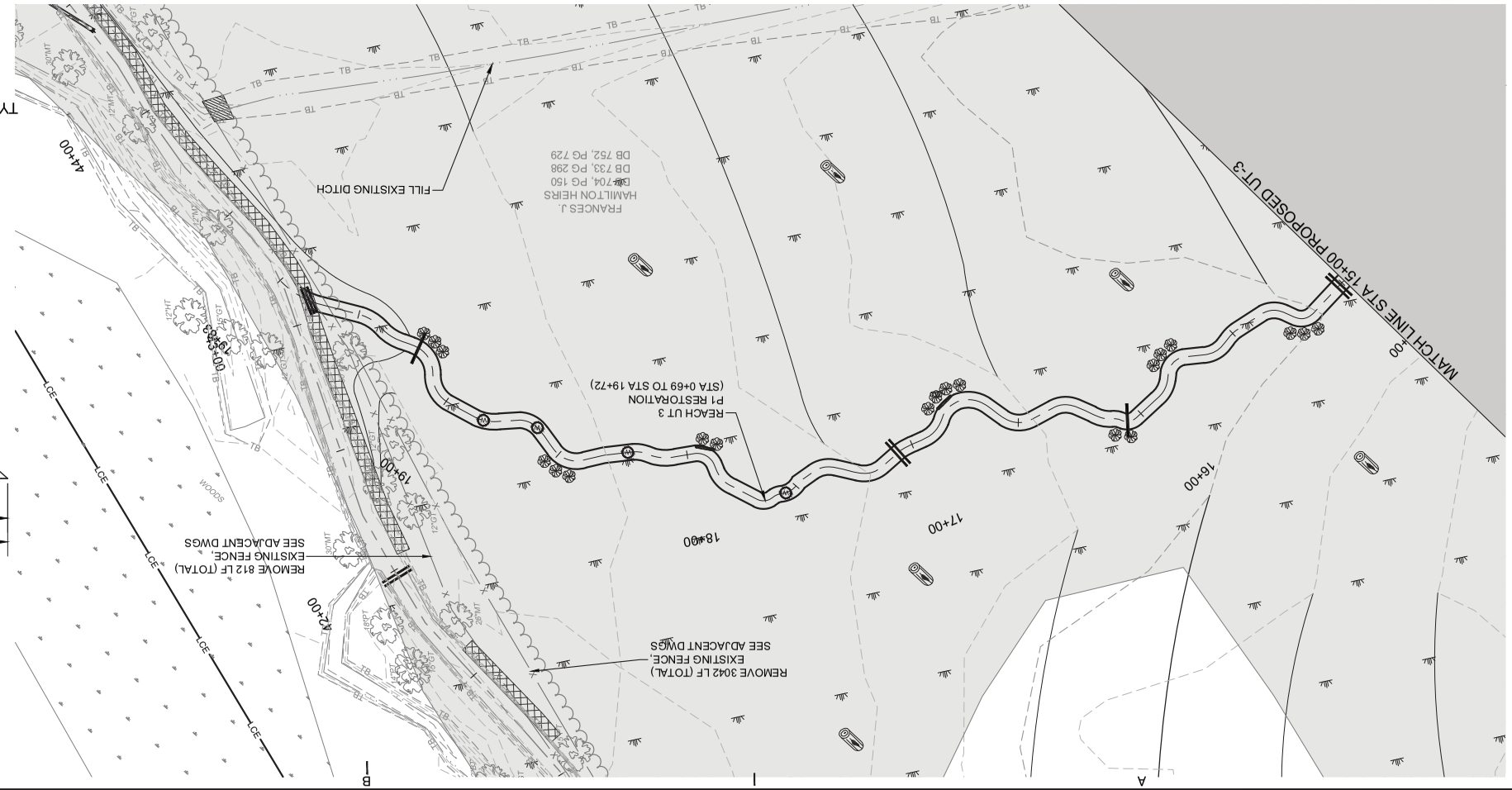

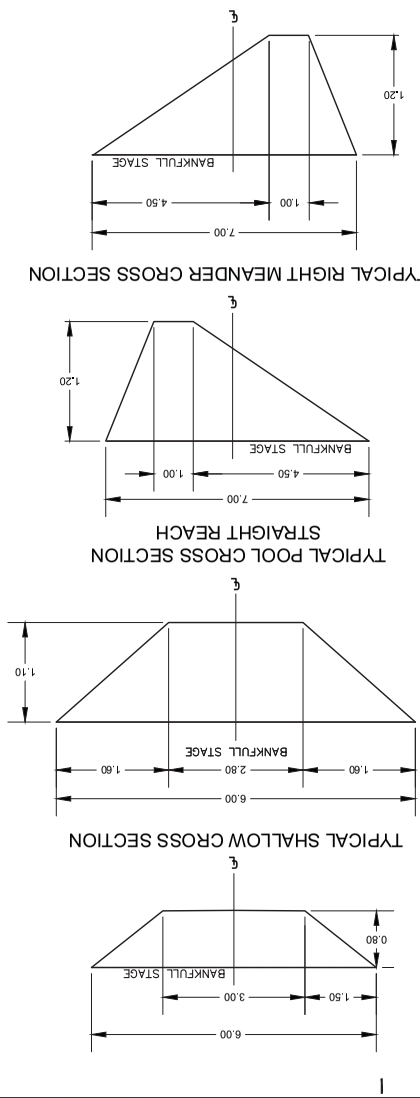

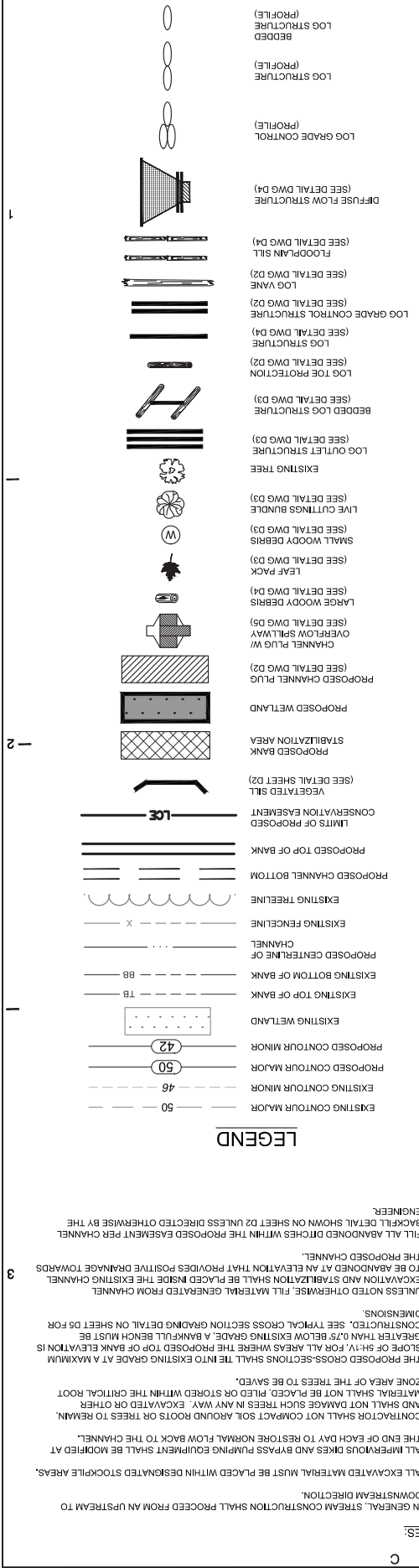

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5. THE PROPOSED CROSS-SECTIONS SHALL TIE INTO EXISTING GRADE AT A MAXIMUM SLOPE OF 5H:1V, FOR ALL AREAS WHERE THE PROPOSED TOP OF BANK ELEVATION IS GREATER THAN 0.75' BELOW EXISTING GRADE. A BANKFULL BENCH MUST BE CONSTRUCTED. SEE TYPICAL CROSS SECTION GRADING DETAIL ON SHEET D5 FOR DIMENSIONS.
6. UNLESS NOTED OTHERWISE, FILL MATERIAL GENERATED FROM CHANNEL EXCAVATION AND STABILIZATION SHALL BE PLACED INSIDE THE EXISTING CHANNEL TO BE ABANDONED AT AN ELEVATION THAT PROVIDES POSITIVE DRAINAGE TOWARDS THE PROPOSED CHANNEL.
7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

WK DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
www.wkdickson.com
NC LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

REVISIONS:

MARK	DATE	DESCRIPTION
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RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
PLAN AND PROFILE UT-3

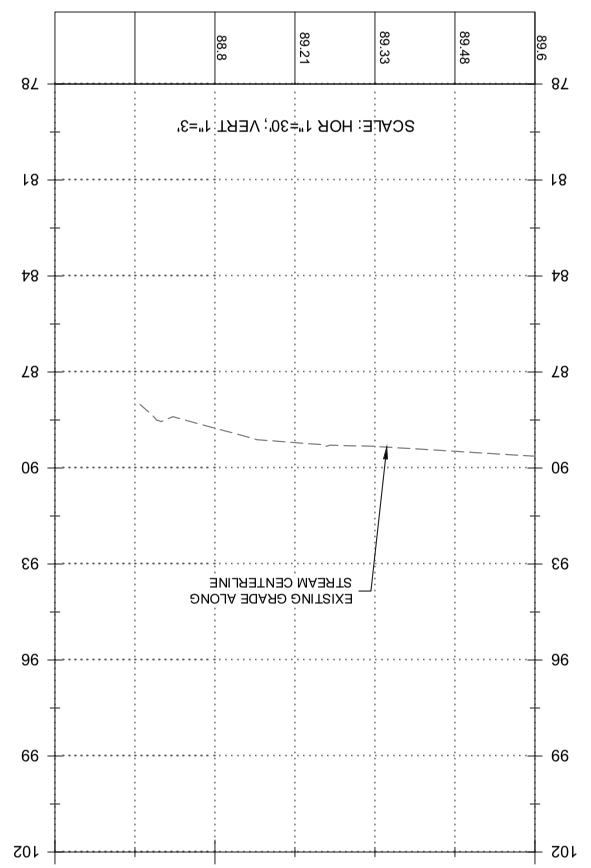
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

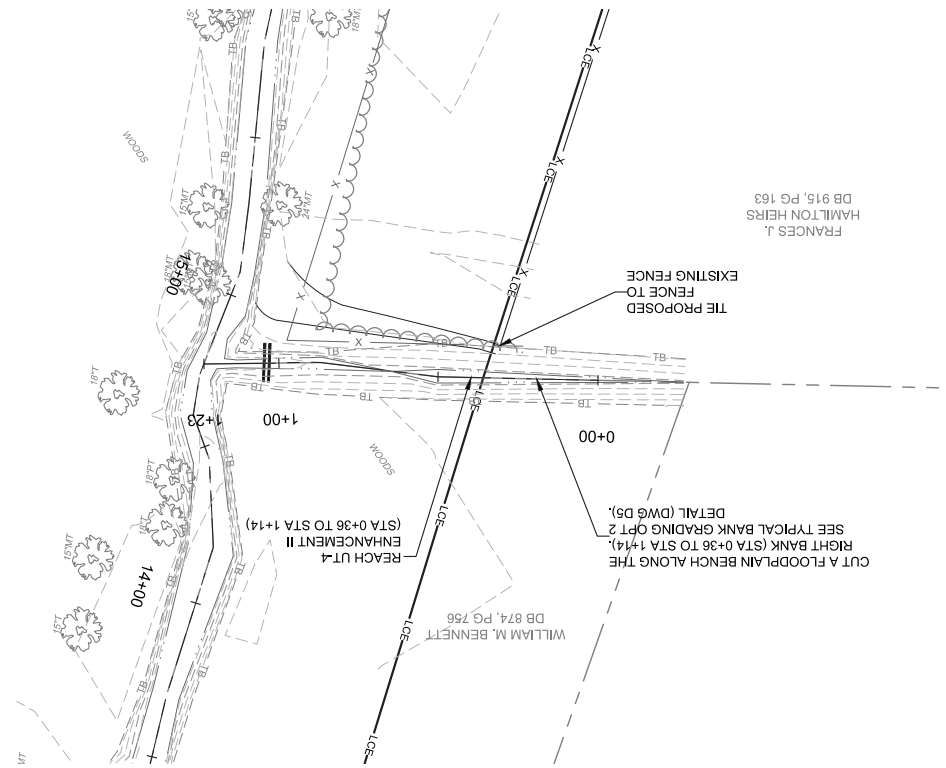
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
18

PROJ. NO.:
20130001000.RA

FILE NAME: I:\Projects\EBX\20130001004A - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\20130001004 SHT UT-1.dwg -#### - April 4, 2014 - Fraisier Mullen





NOTES:

1. IN GENERAL, STREAM CONSTRUCTION SHALL PROCEED FROM AN UPSTREAM TO DOWNSTREAM DIRECTION.
2. ALL EXCAVATED MATERIAL MUST BE PLACED WITHIN DESIGNATED STOCKPILE AREAS.
3. ALL IMERVIOUS DIKES AND BYPASS PUMPING EQUIPMENT SHALL BE MODIFIED AT THE END OF EACH DAY TO RESTORE NORMAL FLOW BACK TO THE CHANNEL.
4. CONTRACTOR SHALL NOT COMPACT SOIL AROUND ROOTS OR TREES TO REMAIN. AND SHALL NOT DAMAGE SUCH TREES IN ANY WAY. EXCAVATED OR OTHER MATERIAL SHALL NOT BE PLACED, PILED OR STORED WITHIN THE CRITICAL ROOT ZONE AREA OF THE TREES TO BE SAVED.
5. THE PROPOSED CROSS-SECTIONS SHALL TIE INTO EXISTING GRADE AT A MAXIMUM SLOPE OF 5H:1V. FOR ALL AREAS WHERE THE PROPOSED TOP OF BANK ELEVATION IS GREATER THAN 0.75' BELOW EXISTING GRADE, A BANKFULL BENCH MUST BE CONSTRUCTED. SEE TYPICAL CROSS SECTION GRADING DETAIL ON SHEET D5 FOR DIMENSIONS.
6. UNLESS NOTED OTHERWISE, FILL MATERIAL GENERATED FROM CHANNEL EXCAVATION AND STABILIZATION SHALL BE PLACED INSIDE THE EXISTING CHANNEL TO BE ABANDONED AT AN ELEVATION THAT PROVIDES POSITIVE DRAINAGE TOWARDS THE PROPOSED CHANNEL.
7. FILL ALL ABANDONED DITCHES WITHIN THE PROPOSED EASEMENT PER CHANNEL BACKFILL DETAIL SHOWN ON SHEET D2 UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

LEGEND

- EXISTING CONTOUR MAJOR — 50 —
- EXISTING CONTOUR MINOR — 46 —
- PROPOSED CONTOUR MAJOR — (50) —
- PROPOSED CONTOUR MINOR — (42) —
- EXISTING WETLAND
- EXISTING TOP OF BANK — TB —
- EXISTING BOTTOM OF BANK — BB —
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE — X —
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT — LCE —
- VEGETATED SILL (SEE DETAIL SHEET D2)
- PROPOSED BANK STABILIZATION AREA
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG (SEE DETAIL DWG D2)
- CHANNEL PLUG W/ OVERFLOW SPILLWAY (SEE DETAIL DWG D5)
- LARGE WOODY DEBRIS (SEE DETAIL DWG D4)
- LEAF PACK (SEE DETAIL DWG D3)
- SMALL WOODY DEBRIS (SEE DETAIL DWG D3)
- LIVE CUTTINGS BUNDLE (SEE DETAIL DWG D3)
- EXISTING TREE
- LOG OUTLET STRUCTURE (SEE DETAIL DWG D3)
- BEDDED LOG STRUCTURE (SEE DETAIL DWG D3)
- LOG TOE PROTECTION (SEE DETAIL DWG D2)
- LOG STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL STRUCTURE (SEE DETAIL DWG D2)
- LOG VANE (SEE DETAIL DWG D2)
- FLOODPLAIN SILL (SEE DETAIL DWG D4)
- DIFFUSE FLOW STRUCTURE (SEE DETAIL DWG D4)
- LOG GRADE CONTROL (PROFILE)
- LOG STRUCTURE (PROFILE)
- BEDDED LOG STRUCTURE (PROFILE)

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NC. LICENSE NO. F-0374

EBX

0 30 60
FULL SCALE: 1"= 30
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

PROJECT NAME:	CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO. NORTH CAROLINA
DRAWING TITLE:	PLAN AND PROFILE UT-4
OWNER / 24 HR CONTACT:	ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS:	909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:	
MOBILE:	

PROJ. DATE:	JAN 2014
Q.C.:	FM
Q.C. DATE:	---

DRAWING NUMBER:

19

PROJ. NO.:: 20130001.00.RA

REVISIONS:

MARK	DATE	DESCRIPTION
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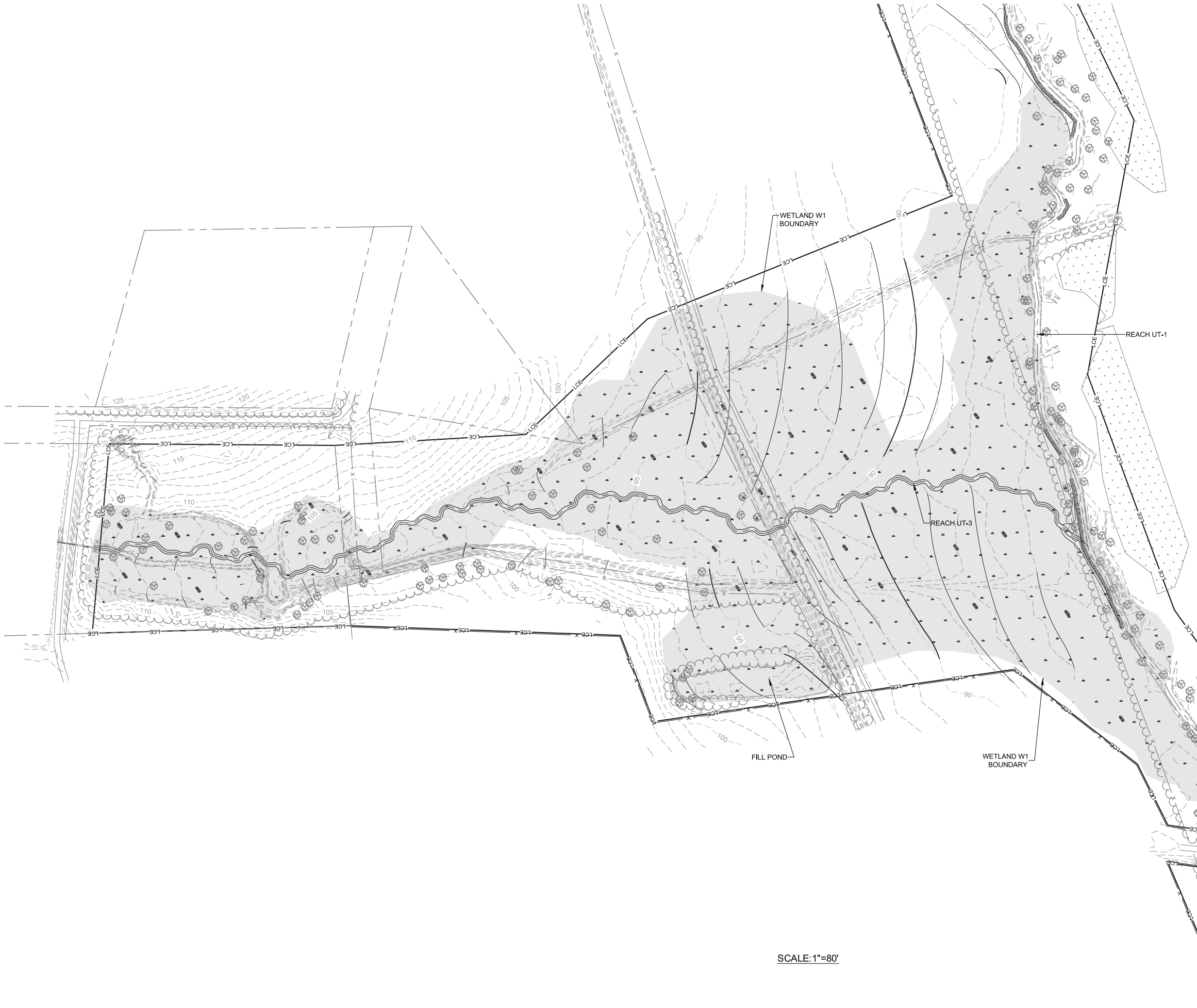

LEGEND

- EXISTING CONTOUR MAJOR
- EXISTING CONTOUR MINOR
- PROPOSED CONTOUR MAJOR
- PROPOSED CONTOUR MINOR
- PROPOSED SPOT SHOT
- EXISTING TOP OF BANK
- EXISTING BOTTOM OF BANK
- PROPOSED CENTERLINE OF CHANNEL
- EXISTING FENCELINE
- EXISTING TREELINE
- PROPOSED CHANNEL BOTTOM
- PROPOSED TOP OF BANK
- LIMITS OF PROPOSED CONSERVATION EASEMENT
- PROPOSED WETLAND
- PROPOSED CHANNEL PLUG
- CHANNEL PLUG W/ OVERFLOW SPILLWAY
- LARGE WOODY DEBRIS
- LEAF PACK
- SMALL WOODY DEBRIS
- LIVE CUTTINGS BUNDLE
- EXISTING TREE
- LOG OUTLET STRUCTURE
- BEDDED LOG STRUCTURE
- LOG TOE PROTECTION
- LOG STRUCTURE
- LOG GRADE CONTROL STRUCTURE
- FLOODPLAIN SILL

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EBX

FULL SCALE: 1"= 80
0 80 160
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR: ---

PROJECT NAME:
CEDAR CREEK STREAM AND
WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
WETLAND W1

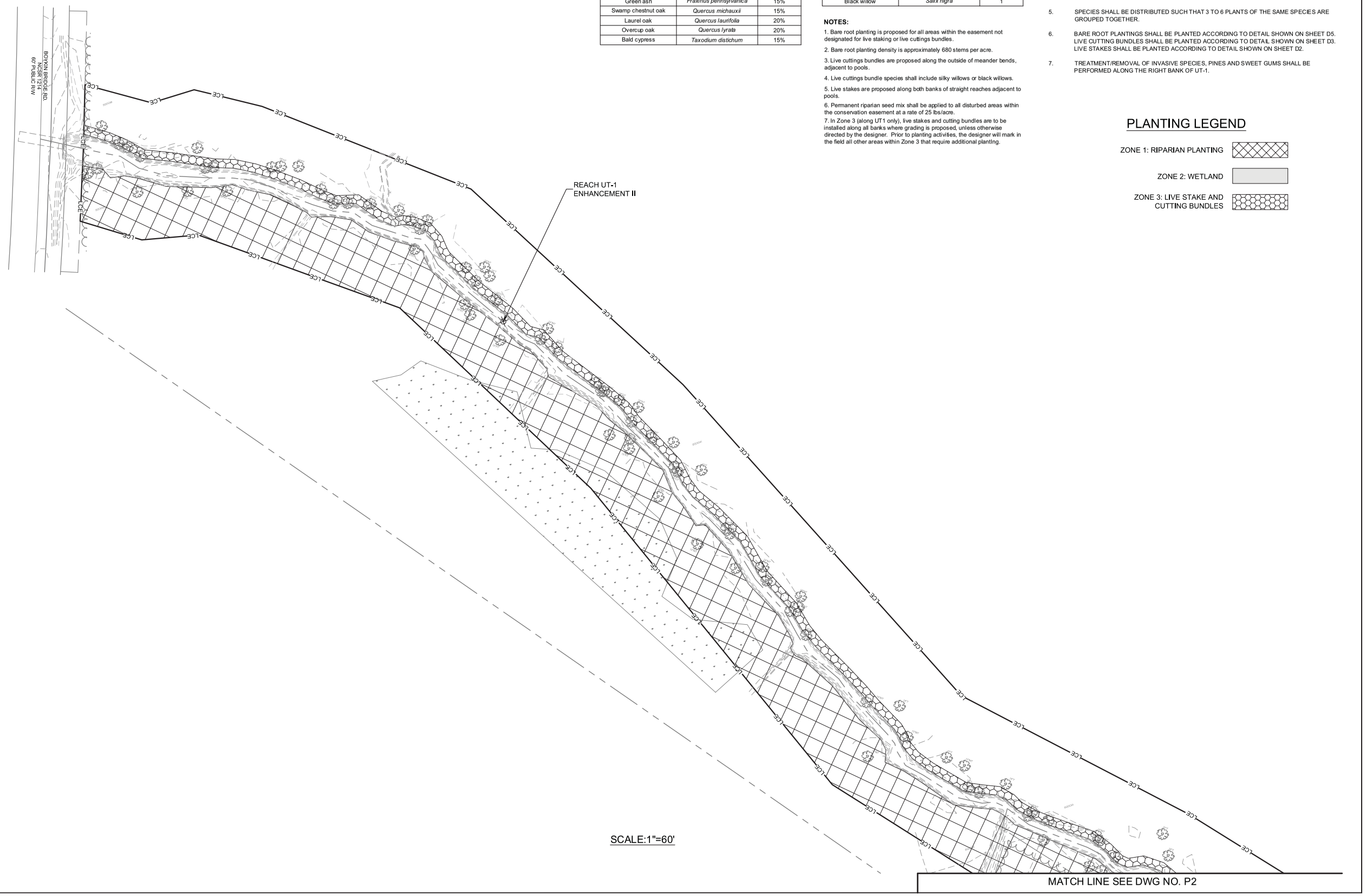
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE:	JAN 2014
Q.C.:	FM
Q.C. DATE:	---

DRAWING NUMBER:
W1

PROJ. N0.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT WETLANDS.dwg -#### - April 4, 2014 - Frasier Mullen



SCALE:1"=60'

PLANTING TABLE

Zone 1		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Tulip Poplar	*Liriodendron tulipifera*	15%
Swamp chestnut oak	*Quercus michauxii*	20%
Water oak	*Quercus nigra*	20%
American sycamore	*Platanus occidentalis*	15%

Zone 2		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Swamp chestnut oak	*Quercus michauxii*	15%
Laurel oak	*Quercus laurifolia*	20%
Overcup oak	*Quercus lyrata*	20%
Bald cypress	*Taxodium distichum*	15%

Permanent Riparian Seed Mix		
Common Name	**Scientific Name**	**Percent Composition**
Virginia Wildrye	*Elymus virginicus*	25%
Switchgrass	*Panicum virgatum*	25%
Little Blue Stem	*Schizachyrium scoparium*	25%
Soft Rush	*Juncus effusus*	25%

Live Staking and Live Cuttings Bundle Tree Species		
Common Name	**Scientific Name**	**Stakes/LF**
Silky dogwood	*Cornus amomum*	1
Silky willow	*Salix sericea*	1
Black willow	*Salix nigra*	1

NOTES:

1. Bare root planting is proposed for all areas within the easement not designated for live staking or live cuttings bundles.
2. Bare root planting density is approximately 680 stems per acre.
3. Live cuttings bundles are proposed along the outside of meander bends, adjacent to pools.
4. Live cuttings bundle species shall include silky willows or black willows.
5. Live stakes are proposed along both banks of straight reaches adjacent to pools.
6. Permanent riparian seed mix shall be applied to all disturbed areas within the conservation easement at a rate of 25 lbs/acre.
7. In Zone 3 (along UT1 only), live stakes and cutting bundles are to be installed along all banks where grading is proposed, unless otherwise directed by the designer. Prior to planting activities, the designer will mark in the field all other areas within Zone 3 that require additional planting.

PLANTING NOTES

ALL PLANTING AREAS

1. EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED UNTIL PERMANENT VEGETATION IS ESTABLISHED. THE CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
2. DISTURBED AREAS NOT AT FINAL GRADE SHALL BE TEMPORARILY VEGETATED WITHIN 10 WORKING DAYS. UPON COMPLETION OF FINAL GRADING, PERMANENT VEGETATION SHALL BE ESTABLISHED FOR ALL DISTURBED AREAS WITHIN 10 WORKING DAYS. SEEDING SHALL BE IN ACCORDANCE WITH EROSION CONTROL PLAN.
3. ALL DISTURBED AREAS SHALL BE PREPARED PRIOR TO PLANTING BY DISC OR SPRING-TOOTH CHISEL PLOW TO MINIMUM DEPTH OF 12 INCHES. MULTIPLE PASSES SHALL BE MADE ACROSS PLANTING AREAS WITH THE IMPLEMENT AND THE FINAL PASS SHALL FOLLOW TOPOGRAPHIC CONTOURS.
4. COIR FABRIC MATERIALS SHALL NOT BE CUT WITH PLANTING IMPLEMENTS. THE SMALLEST OPENING NECESSARY TO ACCOMMODATE EACH PLANT SHALL BE CUT INTO COIR FABRIC USING A SHARP KNIFE OR SHEARS. NO HOLES LARGER THAN 12 INCHES SHALL BE MADE.
5. SPECIES SHALL BE DISTRIBUTED SUCH THAT 3 TO 6 PLANTS OF THE SAME SPECIES ARE GROUPED TOGETHER.
6. BARE ROOT PLANTINGS SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D5. LIVE CUTTING BUNDLES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D3. LIVE STAKES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D2.
7. TREATMENT/REMOVAL OF INVASIVE SPECIES, PINES AND SWEET GUMS SHALL BE PERFORMED ALONG THE RIGHT BANK OF UT-1.

PLANTING LEGEND

ZONE 1: RIPARIAN PLANTING

ZONE 2: WETLAND

ZONE 3: LIVE STAKE AND CUTTING BUNDLES

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www.wkdickson.com
NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLANTING PLAN

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR. SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

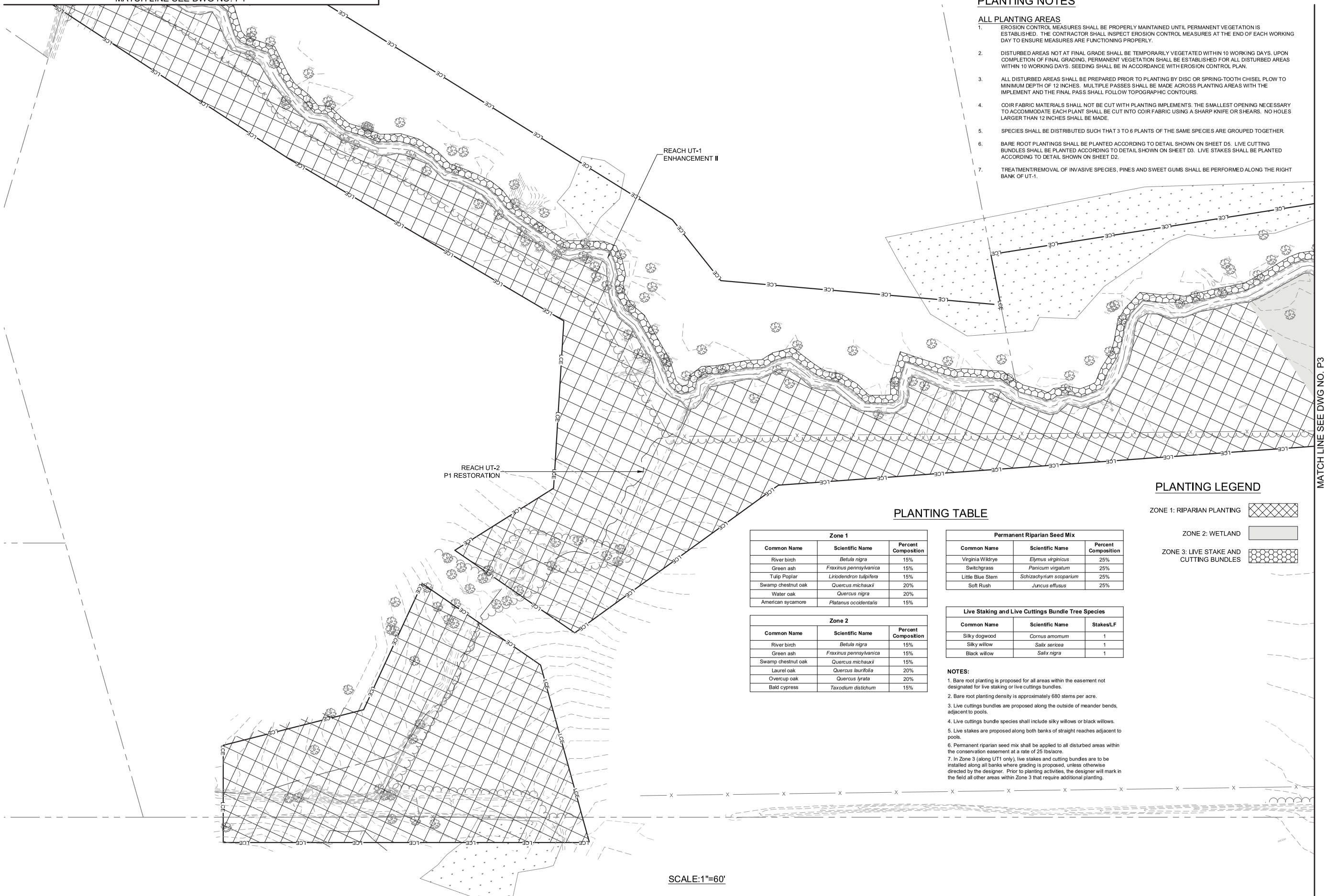
DRAWING NUMBER:

P1

PROJ. N0.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT PLANTING PLAN.dwg -#### - April 4, 2014 - Frasier Mullen

MATCH LINE SEE DWG NO. P1



MATCH LINE SEE DWG NO. P3

PLANTING NOTES

ALL PLANTING AREAS

1. EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED UNTIL PERMANENT VEGETATION IS ESTABLISHED. THE CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
2. DISTURBED AREAS NOT AT FINAL GRADE SHALL BE TEMPORARILY VEGETATED WITHIN 10 WORKING DAYS. UPON COMPLETION OF FINAL GRADING, PERMANENT VEGETATION SHALL BE ESTABLISHED FOR ALL DISTURBED AREAS WITHIN 10 WORKING DAYS. SEEDING SHALL BE IN ACCORDANCE WITH EROSION CONTROL PLAN.
3. ALL DISTURBED AREAS SHALL BE PREPARED PRIOR TO PLANTING BY DISC OR SPRING-TOOTH CHISEL PLOW TO MINIMUM DEPTH OF 12 INCHES. MULTIPLE PASSES SHALL BE MADE ACROSS PLANTING AREAS WITH THE IMPLEMENT AND THE FINAL PASS SHALL FOLLOW TOPOGRAPHIC CONTOURS.
4. COIR FABRIC MATERIALS SHALL NOT BE CUT WITH PLANTING IMPLEMENTS. THE SMALLEST OPENING NECESSARY TO ACCOMMODATE EACH PLANT SHALL BE CUT INTO COIR FABRIC USING A SHARP KNIFE OR SHEARS. NO HOLES LARGER THAN 12 INCHES SHALL BE MADE.
5. SPECIES SHALL BE DISTRIBUTED SUCH THAT 3 TO 6 PLANTS OF THE SAME SPECIES ARE GROUPED TOGETHER.
6. BARE ROOT PLANTINGS SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D5. LIVE CUTTING BUNDLES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D3. LIVE STAKES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D2.
7. TREATMENT/REMOVAL OF INVASIVE SPECIES, PINES AND SWEET GUMS SHALL BE PERFORMED ALONG THE RIGHT BANK OF UT-1.

PLANTING LEGEND

ZONE 1: RIPARIAN PLANTING

ZONE 2: WETLAND

ZONE 3: LIVE STAKE AND CUTTING BUNDLES

PLANTING TABLE

Zone 1

Common Name	Scientific Name	Percent Composition
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Tulip Poplar	*Liriodendron tulipifera*	15%
Swamp chestnut oak	*Quercus michauxii*	20%
Water oak	*Quercus nigra*	20%
American sycamore	*Platanus occidentalis*	15%

Zone 2

Common Name	Scientific Name	Percent Composition
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Swamp chestnut oak	*Quercus michauxii*	15%
Laurel oak	*Quercus laurifolia*	20%
Overcup oak	*Quercus lyrata*	20%
Bald cypress	*Taxodium distichum*	15%

Permanent Riparian Seed Mix

Common Name	Scientific Name	Percent Composition
Virginia Wildrye	*Elymus virginicus*	25%
Switchgrass	*Panicum virgatum*	25%
Little Blue Stem	*Schizachyrium scoparium*	25%
Soft Rush	*Juncus effusus*	25%

Live Staking and Live Cuttings Bundle Tree Species

Common Name	Scientific Name	Stakes/LF
Silky dogwood	*Cornus amomum*	1
Silky willow	*Salix sericea*	1
Black willow	*Salix nigra*	1

NOTES:

1. Bare root planting is proposed for all areas within the easement not designated for live staking or live cuttings bundles.
2. Bare root planting density is approximately 680 stems per acre.
3. Live cuttings bundles are proposed along the outside of meander bends, adjacent to pools.
4. Live cuttings bundle species shall include silky willows or black willows.
5. Live stakes are proposed along both banks of straight reaches adjacent to pools.
6. Permanent riparian seed mix shall be applied to all disturbed areas within the conservation easement at a rate of 25 lbs/acre.
7. In Zone 3 (along UT1 only), live stakes and cutting bundles are to be installed along all banks where grading is proposed, unless otherwise directed by the designer. Prior to planting activities, the designer will mark in the field all other areas within Zone 3 that require additional planting.

MATCH LINE SEE DWG NO. P4

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EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:
RELEASED FOR: ----

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLANTING PLAN

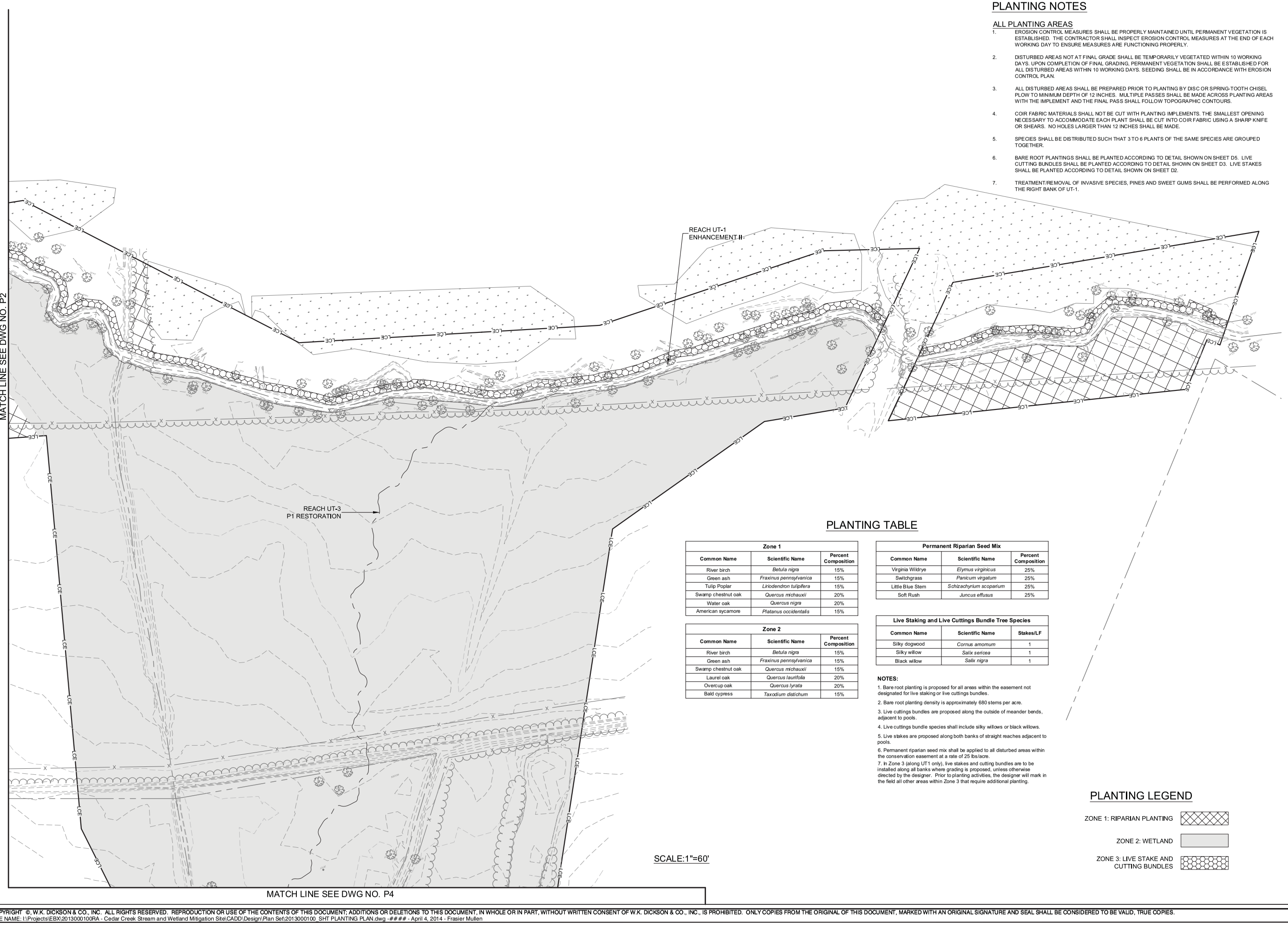
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER: P2

PROJ. NO.: 2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT PLANTING PLAN.dwg -#### - April 4, 2014 - Frasier Mullen



SCALE:1"=60'

PLANTING NOTES

ALL PLANTING AREAS

1. EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED UNTIL PERMANENT VEGETATION IS ESTABLISHED. THE CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
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7. TREATMENT/REMOVAL OF INVASIVE SPECIES, PINES AND SWEET GUMS SHALL BE PERFORMED ALONG THE RIGHT BANK OF UT-1.

PLANTING TABLE

Zone 1		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Tulip Poplar	*Liriodendron tulipifera*	15%
Swamp chestnut oak	*Quercus michauxii*	20%
Water oak	*Quercus nigra*	20%
American sycamore	*Platanus occidentalis*	15%

Zone 2		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Swamp chestnut oak	*Quercus michauxii*	15%
Laurel oak	*Quercus laurifolia*	20%
Overcup oak	*Quercus lyrata*	20%
Bald cypress	*Taxodium distichum*	15%

Permanent Riparian Seed Mix		
Common Name	**Scientific Name**	**Percent Composition**
Virginia Wildrye	*Elymus virginicus*	25%
Switchgrass	*Panicum virgatum*	25%
Little Blue Stem	*Schizachyrium scoparium*	25%
Soft Rush	*Juncus effusus*	25%

Live Staking and Live Cuttings Bundle Tree Species		
Common Name	**Scientific Name**	**Stakes/LF**
Silky dogwood	*Cornus amomum*	1
Silky willow	*Salix sericea*	1
Black willow	*Salix nigra*	1

NOTES:

1. Bare root planting is proposed for all areas within the easement not designated for live staking or live cuttings bundles.
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PLANTING LEGEND

ZONE 1: RIPARIAN PLANTING

ZONE 2: WETLAND

ZONE 3: LIVE STAKE AND CUTTING BUNDLES

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NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 60

0 60 120

2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLANTING PLAN

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:

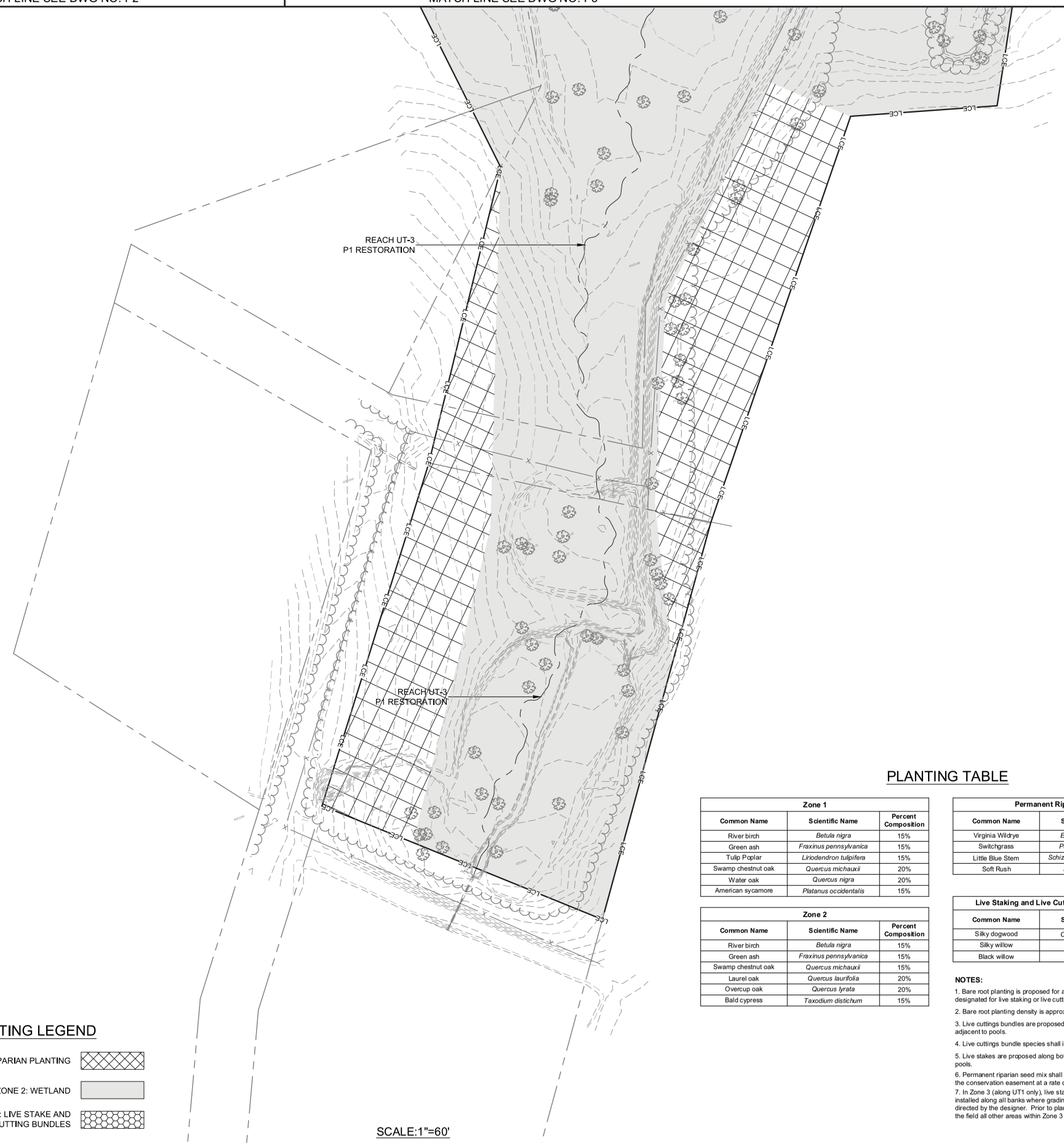
P3

PROJ. N0.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT PLANTING PLAN.dwg -#### - April 4, 2014 - Frasier Mullen

MATCH LINE SEE DWG NO. P2

MATCH LINE SEE DWG NO. P3



PLANTING NOTES

ALL PLANTING AREAS

1. EROSION CONTROL MEASURES SHALL BE PROPERLY MAINTAINED UNTIL PERMANENT VEGETATION IS ESTABLISHED. THE CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
2. DISTURBED AREAS NOT AT FINAL GRADE SHALL BE TEMPORARILY VEGETATED WITHIN 10 WORKING DAYS. UPON COMPLETION OF FINAL GRADING, PERMANENT VEGETATION SHALL BE ESTABLISHED FOR ALL DISTURBED AREAS WITHIN 10 WORKING DAYS. SEEDING SHALL BE IN ACCORDANCE WITH EROSION CONTROL PLAN.
3. ALL DISTURBED AREAS SHALL BE PREPARED PRIOR TO PLANTING BY DISC OR SPRING-TOOTH CHISEL PLOW TO MINIMUM DEPTH OF 12 INCHES. MULTIPLE PASSES SHALL BE MADE ACROSS PLANTING AREAS WITH THE IMPLEMENT AND THE FINAL PASS SHALL FOLLOW TOPOGRAPHIC CONTOURS.
4. COIR FABRIC MATERIALS SHALL NOT BE CUT WITH PLANTING IMPLEMENTS. THE SMALLEST OPENING NECESSARY TO ACCOMMODATE EACH PLANT SHALL BE CUT INTO COIR FABRIC USING A SHARP KNIFE OR SHEARS. NO HOLES LARGER THAN 12 INCHES SHALL BE MADE.
5. SPECIES SHALL BE DISTRIBUTED SUCH THAT 3 TO 6 PLANTS OF THE SAME SPECIES ARE GROUPED TOGETHER.
6. BARE ROOT PLANTINGS SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D5. LIVE CUTTING BUNDLES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D3. LIVE STAKES SHALL BE PLANTED ACCORDING TO DETAIL SHOWN ON SHEET D2.
7. TREATMENT/REMOVAL OF INVASIVE SPECIES, PINES AND SWEET GUMS SHALL BE PERFORMED ALONG THE RIGHT BANK OF UT-1.

PLANTING LEGEND

ZONE 1: RIPARIAN PLANTING

ZONE 2: WETLAND

ZONE 3: LIVE STAKE AND CUTTING BUNDLES

PLANTING TABLE

Zone 1		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Tulip Poplar	*Liriodendron tulipifera*	15%
Swamp chestnut oak	*Quercus michauxii*	20%
Water oak	*Quercus nigra*	20%
American sycamore	*Platanus occidentalis*	15%

Zone 2		
Common Name	**Scientific Name**	**Percent Composition**
River birch	*Betula nigra*	15%
Green ash	*Fraxinus pennsylvanica*	15%
Swamp chestnut oak	*Quercus michauxii*	15%
Laurel oak	*Quercus laurifolia*	20%
Overcup oak	*Quercus lyrata*	20%
Bald cypress	*Taxodium distichum*	15%

Permanent Riparian Seed Mix		
Common Name	**Scientific Name**	**Percent Composition**
Virginia Wildrye	*Elymus virginicus*	25%
Switchgrass	*Panicum virgatum*	25%
Little Blue Stem	*Schizachyrium scoparium*	25%
Soft Rush	*Juncus effusus*	25%

Live Staking and Live Cuttings Bundle Tree Species		
Common Name	**Scientific Name**	**Stakes/LF**
Silky dogwood	*Cornus amomum*	1
Silky willow	*Salix sericea*	1
Black willow	*Salix nigra*	1

NOTES:

1. Bare root planting is proposed for all areas within the easement not designated for live staking or live cuttings bundles.
2. Bare root planting density is approximately 680 stems per acre.
3. Live cuttings bundles are proposed along the outside of meander bends, adjacent to pools.
4. Live cuttings bundle species shall include silky willows or black willows.
5. Live stakes are proposed along both banks of straight reaches adjacent to pools.
6. Permanent riparian seed mix shall be applied to all disturbed areas within the conservation easement at a rate of 25 lbs/acre.
7. In Zone 3 (along UT1 only), live stakes and cutting bundles are to be installed along all banks where grading is proposed, unless otherwise directed by the designer. Prior to planting activities, the designer will mark in the field all other areas within Zone 3 that require additional plantlng.

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NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 60
0 60 120
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR: ----

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: PLANTING PLAN

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ----

DRAWING NUMBER: P4

PROJ. N0.: 2013000100.RA

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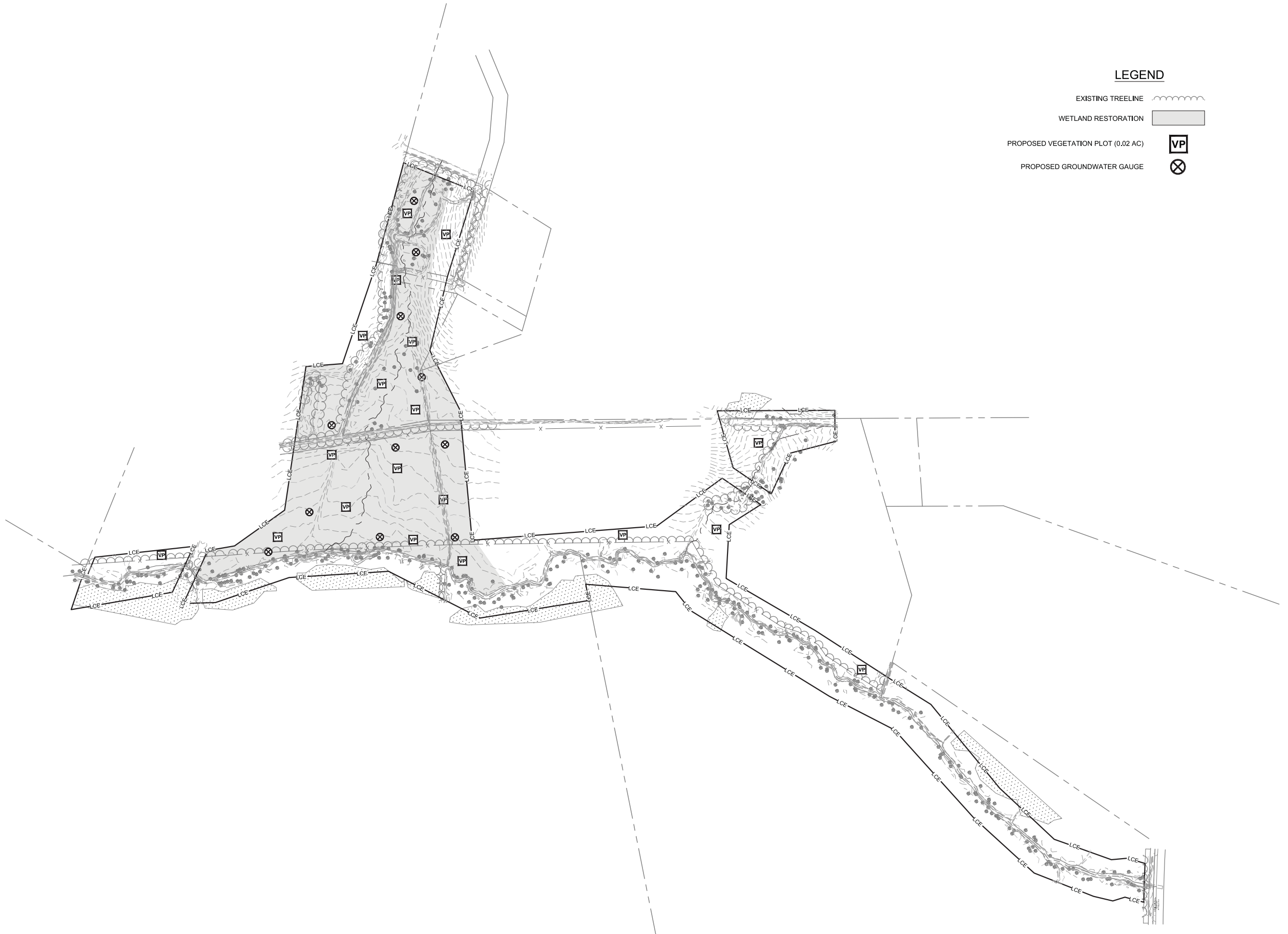

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REVISIONS:

RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
MONITORING LOCATIONS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE:	JAN 2014
Q.C.:	FM
Q.C. DATE:	---

DRAWING NUMBER:
M1

PROJ. NO.:
2013000100.RA

FILE NAME: I:\Projects\EBX\2013000100RA - Cedar Creek Stream and Wetland Mitigation Site\CADD\Design\Plan Set\2013000100_SHT PLANTING PLAN.dwg -#### - April 4, 2014 - Frasier Mullen

WHEN AND WHERE TO USE IT
SILT FENCE IS APPLICABLE IN AREAS:

WHERE THE MAXIMUM SHEET OR OVERLAND FLOW PATH LENGTH TO THE FENCE IS 100–FEET.
WHERE THE MAXIMUM SLOPE STEEPNESS (NORMAL [PERPENDICULAR] TO FENCE LINE) IS 2H:1V.
THAT DO NOT RECEIVE CONCENTRATED FLOWS GREATER THAN 0.5 CFS.

DO NOT PLACE SILT FENCE ACROSS CHANNELS OR USE IT AS A VELOCITY CONTROL BMP.

CONSTRUCTION SPECIFICATIONS:

1. USE A SYNTHETIC FILTER FABRIC OF AT LEAST 95% BY WEIGHT OF POLYOLEFINS OR POLYESTER, WHICH IS CERTIFIED BY THE MANUFACTURER OR SUPPLIER AS CONFORMING TO THE REQUIREMENTS IN ASTM D 6461. SYNTHETIC FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0° TO 120° F.
2. ENSURE THAT POSTS FOR SEDIMENT FENCES ARE 1.33 LB/LINEAR FT STEEL WITH A MINIMUM LENGTH OF 5 FEET. MAKE SURE THAT STEEL POSTS HAVE PROJECTIONS TO FACILITATE FASTENING THE FABRIC.

CONSTRUCTION:

1. CONSTRUCT THE SEDIMENT BARRIER OF EXTRA STRENGTH SYNTHETIC FILTER FABRICS.
2. ENSURE THAT THE HEIGHT OF THE SEDIMENT FENCE DOES NOT EXCEED 24 INCHES ABOVE THE GROUND SURFACE. (HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.)
3. CONSTRUCT THE FILTER FABRIC FROM A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID JOINTS. WHEN JOINTS ARE NECESSARY, SECURELY FASTEN THE FILTER CLOTH ONLY AT A SUPPORT POST WITH 4 FEET MINIMUM OVERLAP TO THE NEXT POST.
4. EXTRA STRENGTH FILTER FABRIC WITH 6 FEET POST SPACING DOES NOT REQUIRE WIRE MESH SUPPORT FENCE. SECURELY FASTEN THE FILTER FABRIC DIRECTLY TO POSTS. WIRE OR PLASTIC ZIP TIES SHOULD HAVE MINIMUM 50 POUND TENSILE STRENGTH.
5. EXCAVATE A TRENCH APPROXIMATELY 4 INCHES WIDE AND 8 INCHES DEEP ALONG THE PROPOSED LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
6. PLACE 12 INCHES OF THE FABRIC ALONG THE BOTTOM AND SIDE OF THE TRENCH.
7. BACKFILL THE TRENCH WITH SOIL PLACED OVER THE FILTER FABRIC AND COMPACT. THOROUGH COMPACTION OF THE BACKFILL IS CRITICAL TO SILT FENCE PERFORMANCE.
8. DO NOT ATTACH FILTER FABRIC TO EXISTING TREES.

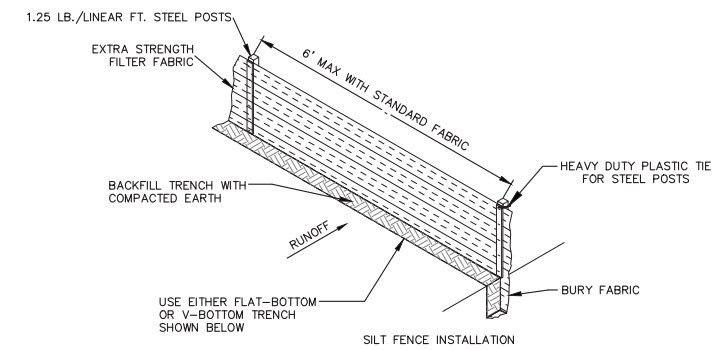
MAINTENANCE:

INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.

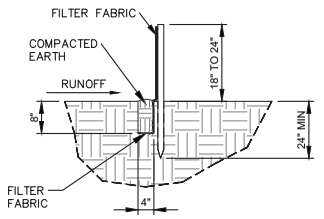
SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.

REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.

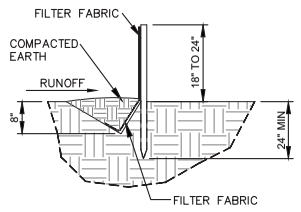
REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.



SILT FENCE INSTALLATION



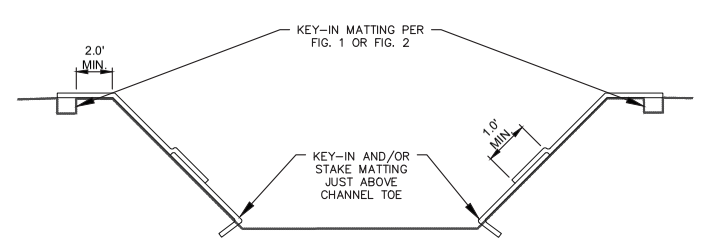
FLAT–BOTTOM TRENCH DETAIL

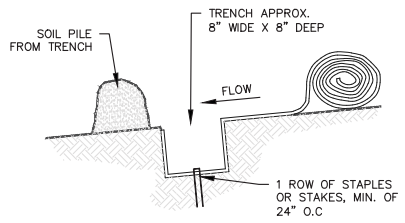


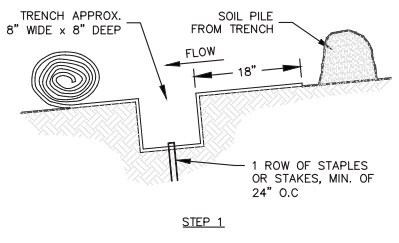
V–SHAPED TRENCH DETAIL

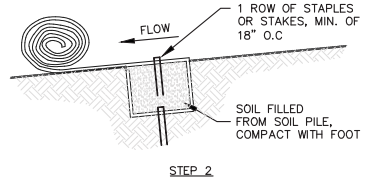
TEMPORARY SILT FENCE

NTS









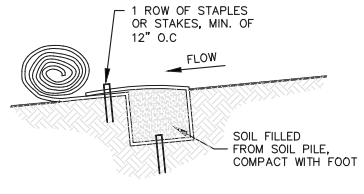


FIGURE 1

FIGURE 2

EROSION CONTROL MATTING

NTS

INSTALLATION NOTES:

SITE PREPARATION

GRADE AND COMPACT AREA.

REMOVE ALL ROCKS, CLODS, VEGETATION, AND OBSTRUCTIONS SO THAT MATTING WILL HAVE DIRECT CONTACT WITH THE SOIL.

PREPARE SEEDBED BY LOOSENING 3 TO 4 INCHES OF TOPSOIL ABOVE FINAL GRADE.

TEST SOILS FOR ANY NUTRIENT DEFICIENCIES AND SUBMIT SOIL TEST RESULTS TO THE ENGINEER. APPLY ANY TREATMENT SUCH AS LIME OR FERTILIZERS TO THE SOIL IF NEEDED.

SEEDING

SEE SHEETS ##, ##, ## FOR SEEDING REQUIREMENTS.

APPLY SEED TO SOIL BEFORE PLACING MATTING.

INSTALLATION - STREAM BANK

SEE GRADING NOTES ON PLAN AND PROFILE SHEETS AND ON SHEET ## FOR INFORMATION REGARDING WHAT AREAS ARE TO RECEIVE EROSION CONTROL MATTING.

OVERLAP ADJACENT MATS 3" (IN DIRECTION PARALLEL TO FLOW) AND ANCHOR EVERY 12" ACROSS THE OVERLAP. THE UPSTREAM MAT SHOULD BE PLACED OVER THE DOWNSTREAM MAT.

EDGES SHOULD BE SHINGLED AWAY FROM THE FLOW OF WATER.

LAY MAT LOOSE TO ALLOW CONTACT WITH SOIL. DO NOT STRETCH TIGHT.

ANCHOR MAT USING BIODEGRADABLE STAKES OR PINS.

CUT 8" x 8" TRENCH ALONG TOP OF BANK FOR MAT TERMINATION AS SHOWN IN FIGURES 1 & 2. EXTEND MAT 2 TO 3 FEET PAST TOP OF BANK.

PLACE ADJACENT ROLLS IN THE ANCHOR TRENCH WITH A MINIMUM OF 4" OVERLAP. SECURE WITH BIODEGRADABLE STAKES OR PINES. BACKFILL ANCHOR TRENCH, AND COMPACT SOIL.

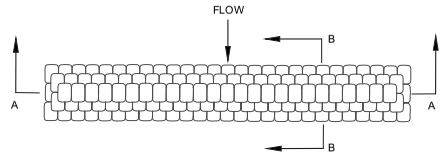
STAPLE AT 12" INTERVALS ALONG OVERLAP.

STREAM BANK MATTING TO BE INSTALLED FROM TOE OF BANK TO A MINIMUM OF 2.0' PAST TOP OF BANK. SEE FIGURE 3 FOR TERMINATION AT TOP OF BANK.

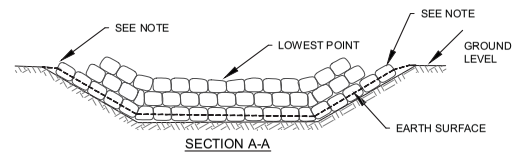
IF MORE THAN ROLL IS REQUIRED TO COVER THE CHANNEL FROM THE TOP OF BANK DOWN TO THE TOE, THEN OVERLAP MATTING BY A MINIMUM OF 1'.

EROSION CONTROL MATTING MUST MEET OR EXCEED THE FOLLOWING REQUIREMENTS:

- 100 % COCONUT FIBER (COIR) TWINE WOVEN INTO A HIGH STRENGTH MATRIX
- THICKNESS - 0.35 IN. MINIMUM.
- TENSILE STRENGTH - 1032 LB/FT MINIMUM
- SHEAR STRESS – 4.5 LBS/SQFT
- FLOW VELOCITY- OBSERVED 12 FT/SEC
- WEIGHT - 23 OZ/SY
- OPEN AREA (MEASURED) - 48%
- SLOPES – UP TO A MAXIMUM OF 1:1



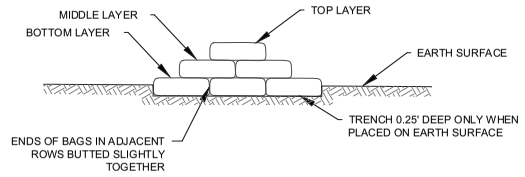
PLAN VIEW



SECTION A-A

NOTE: END OF DIKE AT GROUND LEVEL TO BE HIGHER THAN THE LOWEST POINT OF FLOW CHECK. SUFFICIENT SANDBAGS ARE TO BE PLACED TO PREVENT SCOURING.

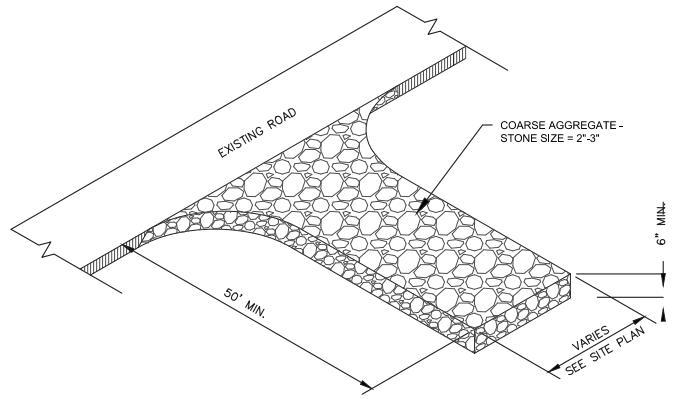
SANDBAG BARRIERS SHALL BE CONSTRUCTED OF THREE LAYERS OF SANDBAGS. THE BOTTOM LAYER SHALL CONSIST OF 3 ROWS OF BAGS, THE MIDDLE LAYER SHALL CONSIST OF 2 ROWS OF BAGS AND THE TOP LAYER SHALL CONSIST OF 1 ROW OF BAGS. THE RECOMMENDED DIMENSION OF A FILLED SANDBAG SHALL BE APPROXIMATELY 0.5 FT X 0.5 FT X 1.5 FT.



SECTION B-B

SANDBAG IMPERVIOUS DIKE

NTS



PURPOSE:

STABILIZED CONSTRUCTION ENTRANCES SHOULD BE USED AT ALL POINTS WHERE TRAFFIC WILL BE LEAVING A CONSTRUCTION SITE AND MOVING DIRECTLY ONTO A PUBLIC ROAD.

CONSTRUCTION SPECIFICATIONS:

1. CLEAR THE ENTRANCE AND EXIT AREA OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL AND PROPERLY GRADE IT.
2. PLACE THE GRAVEL TO THE SPECIFIC GRADE AND DIMENSIONS SHOWN ON THE DETAIL, AND SMOOTH IT.
3. PROVIDE DRAINAGE TO CARRY WATER TO A SEDIMENT TRAP OR OTHER SUITABLE OUTLET.
4. USE GEOTEXTILE FABRICS BECAUSE THEY IMPROVE STABILITY OF THE FOUNDATION IN LOCATIONS SUBJECT TO SEEPAGE OR HIGH WATER TABLE.

MAINTENANCE:

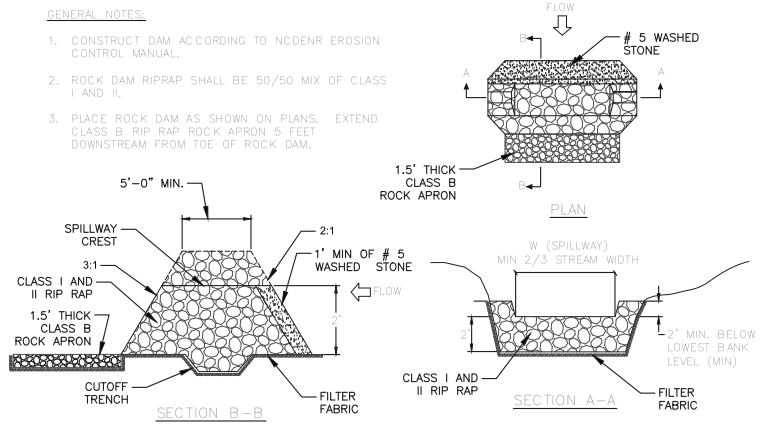
MAINTAIN THE GRAVEL PAD IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH 2–INCH STONE. AFTER EACH RAINFALL, INSPECT ANY STRUCTURE USED TO TRAP SEDIMENT AND CLEAN IT OUT AS NECESSARY. IMMEDIATELY REMOVE ALL OBJECTIONABLE MATERIALS SPILLED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS, OR AIRFIELD PAVEMENTS.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

NTS

GENERAL NOTES:

1. CONSTRUCT DAM ACCORDING TO NCDENR EROSION CONTROL MANUAL.
2. ROCK DAM RIPRAP SHALL BE 50/50 MIX OF CLASS I AND II.
3. PLACE ROCK DAM AS SHOWN ON PLANS. EXTEND CLASS B RIP RAP ROCK APRON 5 FEET DOWNSTREAM FROM TOE OF ROCK DAM.



TEMPORARY ROCK CHECK DAM

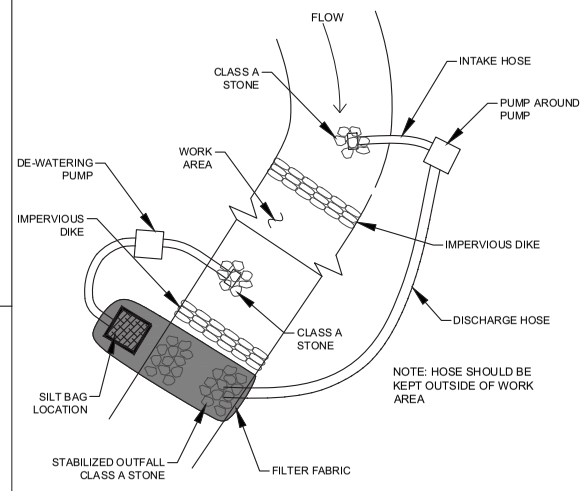
NTS

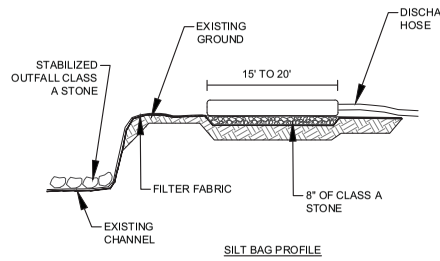
NOTES:

1. EXCAVATION SHALL BE PERFORMED ONLY IN DRY AND/OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES SHOULD BE USED TO ISOLATE WORK AREAS FROM STREAM FLOW.
3. THE CONTRACTOR SHALL NOT DISTURB MORE AREA THAN CAN BE STABILIZED IN ONE WORKING DAY, A MAXIMUM OF 200 FEET MAY BE DISTURBED AT ANY ONE TIME.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING PUMP SIZE SUFFICIENT TO PUMP BASE FLOW.
5. DIKE MUST BE CONSTRUCTED OF NON–ERODIBLE MATERIALS SUCH AS SANDBAGS.

SEQUENCE OF CONSTRUCTION FOR TYPICAL PUMP AROUND

1. INSTALL STILLING BASIN AND STABILIZED OUTFALL USING CLASS A RIP RAP AT THE DOWNSTREAM END OF THE DESIGNATED PROJECT WORKING AREA.
2. THE CONTRACTOR SHALL INSTALL THE PUMP AROUND PUMP AND THE TEMPORARY PIPING THAT WILL CONVEY THE BASE FLOW FROM UPSTREAM OF THE WORK AREA TO THE STABILIZED OUTFALL.
3. INSTALL UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. INSTALL THE DOWNSTREAM IMPERVIOUS DIKE AND DEWATERING PUMPING APPARATUS IF NEEDED TO DEWATER THE ENTRAPPED AREA. THE PUMP AND HOSE FOR THIS PURPOSE SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA. THIS WATER WILL ALSO BE PUMPED TO AN OUTFALL STABILIZED WITH CLASS A RIP RAP.
5. THE CONTRACTOR SHALL EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF THE IMPERVIOUS DIKE. WHEN DEWATERING AREA, ALL DIRTY WATER MUST BE PUMPED THROUGH A SILT BAG. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE/PIPING STARTING WITH THE DOWNSTREAM DIKE FIRST.
6. ONCE THE WORKING AREA IS COMPLETED, REMOVE ALL RIP RAP AND IMPERVIOUS DIKES AND STABILIZE DISTURBED AREAS WITH SEED AND MULCH.
7. ALL WORK IN CHANNEL MUST BE COMPLETED BEFORE REMOVING IMPERVIOUS DIKE.





SILT BAG PROFILE

PUMP AROUND & DEWATERING DETAIL

NTS

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FULL SCALE: 1"= NTS
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MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR: ----

PLOT DATE: 4/4/2014

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: DETAILS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

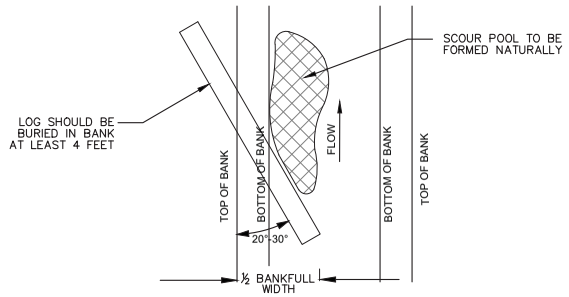
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:

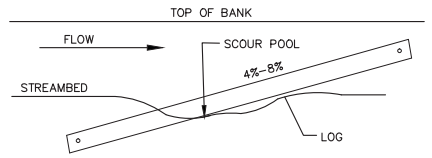
D1

PROJ. NO.: 2013000100.RA

FILE NAME:



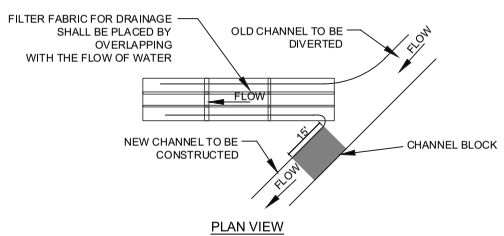
PLAN VIEW



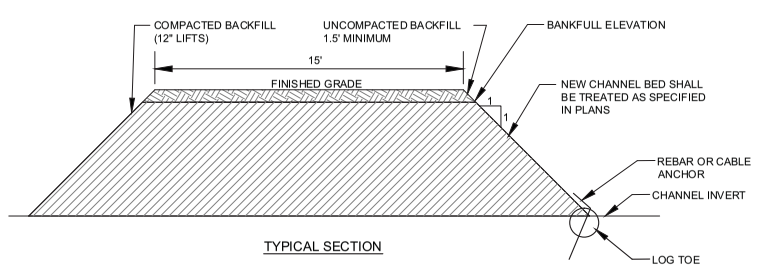
PROFILE VIEW

NOTES:
1. LOGS SHOULD BE AT LEAST 8 INCHES IN DIAMETER, 20 FEET LONG, RELATIVELY STRAIGHT, AND HARDWOOD.
2. VANE LOG ARMS SHOULD BE BURIED INTO THE BANK AND BED A MINIMUM OF 4 FEET.
3. SET ELEVATION OF TOP OF LOG CROSS PIECES TO DESIRED ELEVATION OF STREAMBED.
4. REBAR (5/8" MINIMUM DIAMETER 3' MIN. LENGTH TYPICAL) SHOULD BE PLACED 1' TO 3' FROM END OF LOG. ADDITIONAL REBAR TO BE PLACED AT 5' OFFSETS. LAST REBAR SHOULD BE PLACED 1' TO 3' FROM END OF LOG. DUCK BILL ANCHORS MAY BE USED AS A SUBSTITUTION FOR REBAR.
5. PRE-DRILL HOLES FOR REBAR WITH 5/8" DRILL BIT.
6. DRIVE REBAR THROUGH LOGS AND BEND ENDS AS SHOWN.

LOG VANE
NTS

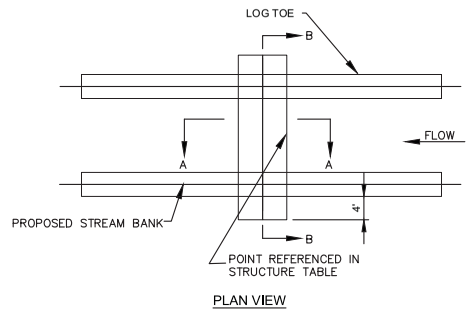


PLAN VIEW

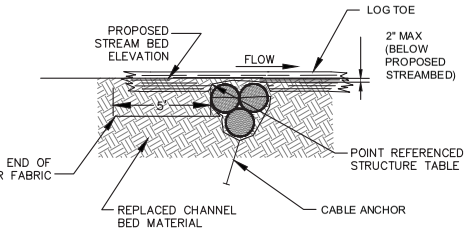


TYPICAL SECTION

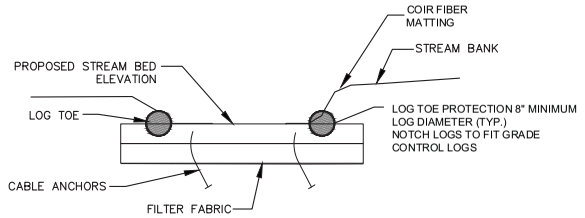
CHANNEL PLUG
NTS



PLAN VIEW



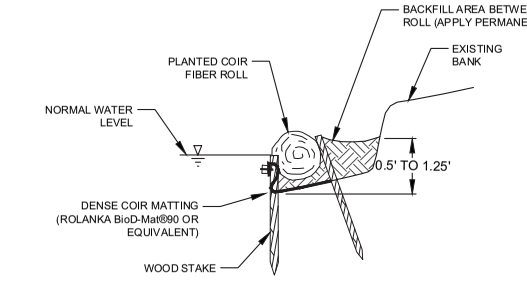
SECTION A-A



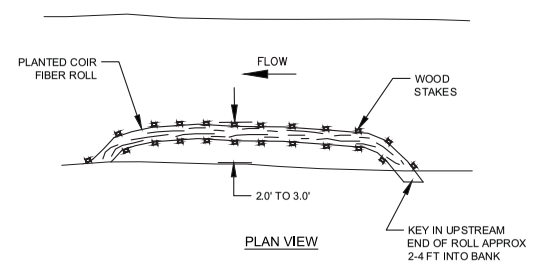
GRADE CONTROL STRUCTURE
SECTION B-B

1. LOGS SHOULD BE AT LEAST 8 TO 10 INCHES IN DIAMETER, A MINIMUM OF 14 FEET IN LENGTH (UNLESS OTHERWISE NOTED), AND RELATIVELY STRAIGHT.
2. NAIL FILTER FABRIC USING 3" 10D GALVANIZED COMMON NAIL EVERY 2' ALONG THE LOG.
3. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.

LOG GRADE CONTROL
NTS



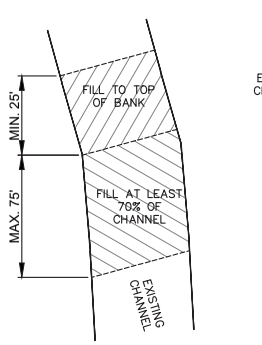
SECTION VIEW

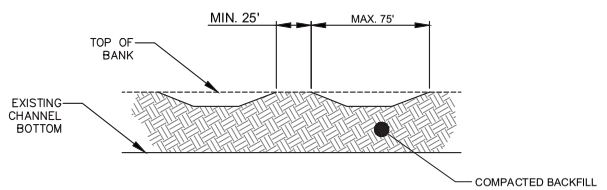


PLAN VIEW

NOTES:
1. DESIGNER TO MARK LOCATIONS AND DIMENSIONS OF SILLS IN THE FIELD PRIOR TO CONSTRUCTION.
2. INSTALL STAKES ON 3' CENTERS ON EACH SIDE OF ROLL. TOP OF STAKE SHOULD NOT EXTEND ABOVE ROLL.
3. EXCAVATE A SMALL TRENCH (APPROX 2in DEEP) FOR PLACEMENT OF ROLL.

VEGETATED SILL DEFLECTOR
NTS

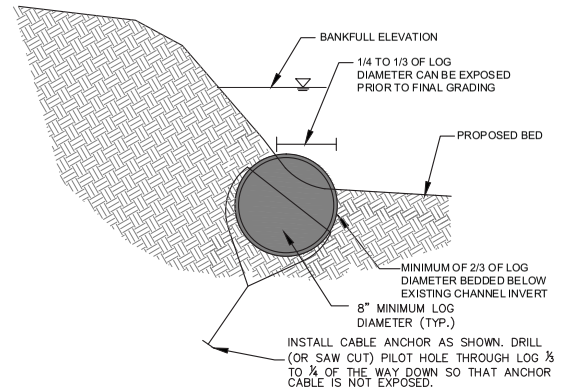




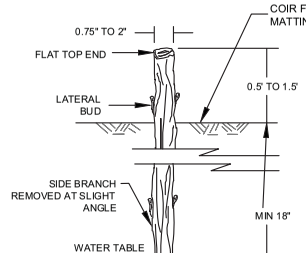
NOTES:
1. FILL EXISTING CHANNEL TO BANKFULL ELEVATION WHEN POSSIBLE.
2. CHANNEL MUST BE FILLED IN 12" TO 18" LIFTS.
3. IF CHANNEL CANNOT BE COMPLETELY FILLED TO TOP OF BANK, FILL TO TOP OF BANK FOR 25' OUT OF EVERY 100' SEGMENT.

CHANNEL BACKFILL
NTS

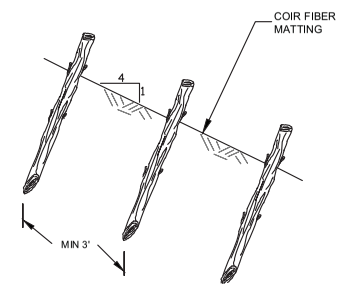
NOTES:
1. LOGS SHOULD BE AT LEAST 8 INCHES IN DIAMETER, 5-8 FEET LONG, RELATIVELY STRAIGHT, AND HARDWOOD.
2. CABLE ANCHORS SHOULD BE PLACED 1' TO 3' FROM EACH END OF LOG. REBAR (5/8" MINIMUM DIAMETER 3' MIN. LENGTH TYPICAL) MAY BE USED AS A SUBSTITUTION FOR CABLE ANCHORS PER DIRECTION OF ENGINEER.
3. IF REBAR IS USED, PRE-DRILL HOLES WITH 5/8" DRILL BIT.



LOG TOE PROTECTION
NTS



DETAIL
LIVE STAKES SHOULD BE LONG ENOUGH TO REACH BELOW THE GROUNDWATER TABLE. (GENERALLY, A LENGTH OF 2 TO 3 FEET IS SUFFICIENT.) ADDITIONALLY, THE STAKES SHOULD HAVE A DIAMETER IN THE RANGE OF 0.75 TO 2 INCHES.



SECTION VIEW
LIVE STAKES SHALL BE SPACED 3 FEET APART, ALTERNATE SPACING.

NOTE:
1. ACCEPTABLE SPECIES INCLUDE BLACK WILLOW (SALIX NIGRA), SILKY WILLOW (SALIX SERICEA) AND SILKY DOGWOOD (CORNUS AMMONUM).
2. LIVE STAKES SHALL BE PLANTED IN AN AREA EXTENDING 3 FEET OUT FROM TOP OF BANK TO JUST BELOW BANKFULL.

LIVE STAKE
NTS

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Urban Development + Geomatics
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EBX

FULL SCALE: 1"= NTS
0 NTS NTS
2" = FULL SCALE
1" = HALF SCALE

MARK	DATE	DESCRIPTION
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PLOT DATE: 4/4/2014

REVISIONS:

RELEASED FOR: ----

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: DETAILS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

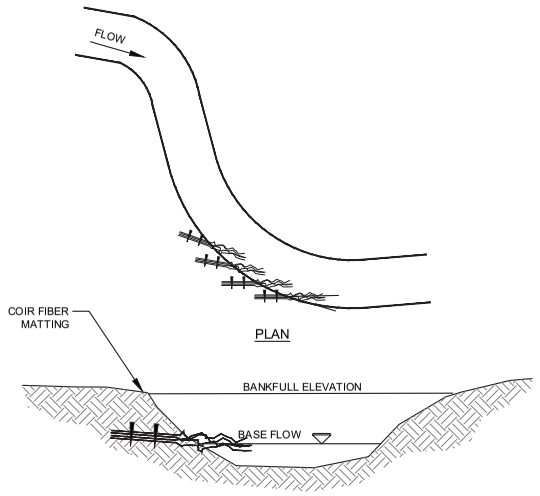
PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:

D2

PROJ. NO.: 2013000100.RA

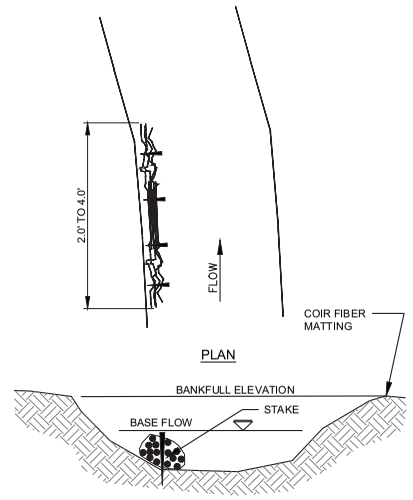
FILE NAME:



TYPICAL SECTION

NOTE:
WATTLES ARE TO BE INSTALLED 4' O.C. BY CUTTING AN APPROXIMATELY 4" WIDE TRENCH PERPENDICULAR TO THE STREAM BANK JUST ABOVE BASEFLOW ELEVATION. INSERT THE WATTLES, ANCHORING WITH STAKES, AND TIGHTLY BACKFILL WITH TOPSOIL. WATTLES SHALL CONSIST OF 5 TO 10 STEMS, 0.25" TO 0.5" IN DIAMETER. MINIMUM LENGTH IS 4.5 FEET. AT LEAST 3.0 FEET SHALL BE INSTALLED WITHIN THE BANK. WATTLES SHOULD BE INSTALLED AT AN ANGLE OF 20° TO 30° TO THE STREAM BANK AND SHOULD POINT DOWNSTREAM. FILL VOIDS OF EXPOSED PORTION OF WATTLE WITH PINE STRAW (IF READILY AVAILABLE ON-SITE).

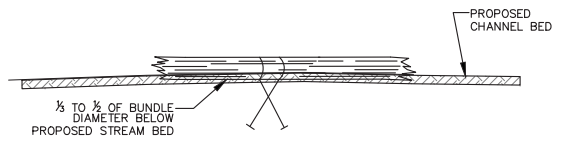
WATTLE



TYPICAL SECTION

NOTE: USE DEAD BRUSH AND TOPS 0.5 TO 2.0 INCHES IN DIAMETER. TIE BUNDLES WITH TWINE AND STAKE TO THE CHANNEL BED. IF PINE STRAW IS READILY AVAILABLE ON-SITE, ADD TO BUNDLE.

DEAD BRUSH



USE STICKS AND LOGS OF VARYING SIZES 1"–4" DIAMETER AND 1'–3' LONG. WOODY DEBRIS SHALL BE HELD IN PLACE USING TWINE AND WOODEN STAKES AND SHALL BE PLACED ACCORDING TO DESIGN PLANS AND AS DIRECTED BY ENGINEER.

WOODY DEBRIS BUNDLE

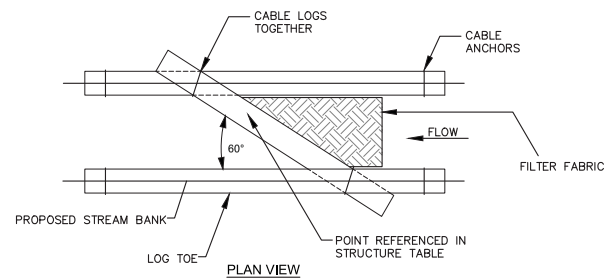
NOTE:
WHEN INSTALLING SMALL WOODY DEBRIS STRUCTURES AS LOCATED ON THE PLAN SHEETS, CONTRACTOR SHALL ALTERNATE BETWEEN WATTLE, SMALL LOG, AND DEAD BRUSH STRUCTURES BASED ON READILY AVAILABLE MATERIALS AND PER DIRECTION OF THE ENGINEER.

SMALL WOODY DEBRIS & HABITAT STRUCTURES

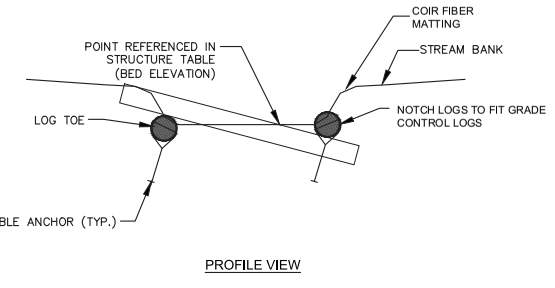
NTS

NOTES:

1. CROSS LOGS SHOULD BE AT LEAST 6 INCHES IN DIAMETER AND A MINIMUM OF 12 FEET IN LENGTH.
2. LOG TOES SHOULD BE AT LEAST 8 INCHES IN DIAMETER AND A MINIMUM OF 5 FEET IN LENGTH.
3. ALL LOGS SHOULD BE RELATIVELY STRAIGHT.
4. NAIL FILTER FABRIC USING 3" 10D GALVANIZED COMMON NAIL EVERY 2' ALONG THE LOG.
5. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.



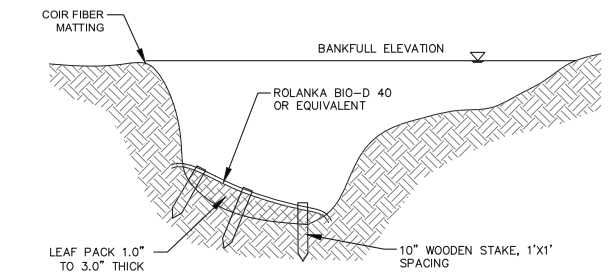
PLAN VIEW



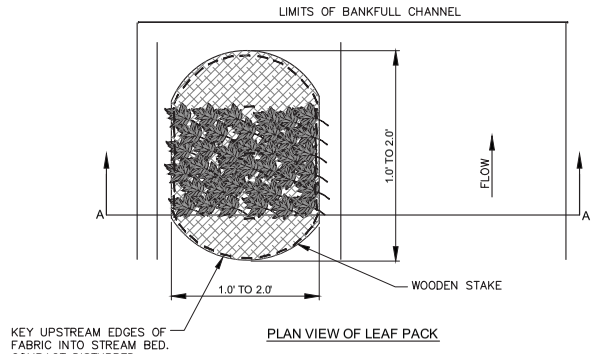
PROFILE VIEW

BEDDED LOG STRUCTURE

NTS



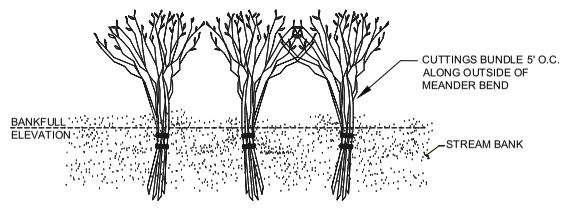
SECTION A-A



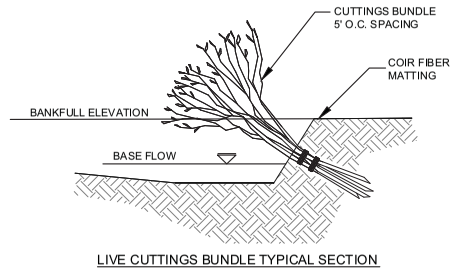
PLAN VIEW OF LEAF PACK

LEAF PACK

NTS



LIVE CUTTINGS BUNDLE TYPICAL PROFILE



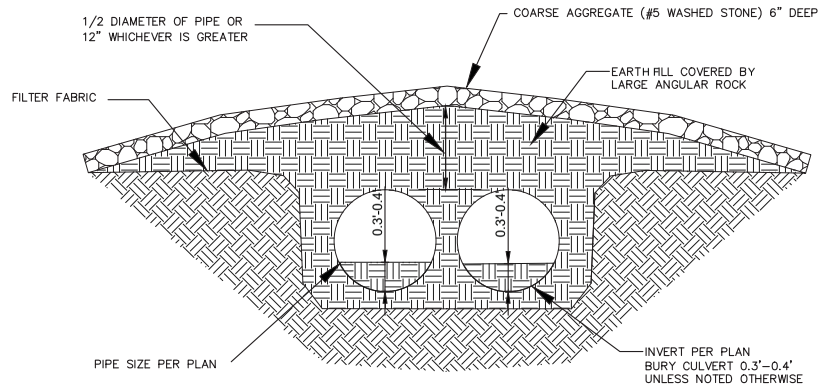
LIVE CUTTINGS BUNDLE TYPICAL SECTION

NOTE: ACCEPTABLE SPECIES INCLUDE BLACK WILLOW (SALIX NIGRA) AND SILKY WILLOW (SALIX SERICEA). CUTTINGS BUNDLES ARE TO BE INSTALLED (AFTER SOD MAT HAS BEEN PLACED) BY DRILLING AN APPROXIMATE 4" DIAMETER HOLE INTO THE STREAM BANK FROM AN ELEVATION SLIGHTLY ABOVE BANKFULL ELEVATION, INSERTING THE CUTTINGS AND TIGHTLY BACKFILLING WITH TOPSOIL. WILLOW CUTTINGS SHOULD BE RINSED AT CUTTING POINT TO ALLOW BETTER ROOTING. ALDER TRANSPLANTS CAN BE SUBSTITUTED FOR CUTTINGS BUNDLES WITH APPROVAL OF ENGINEER

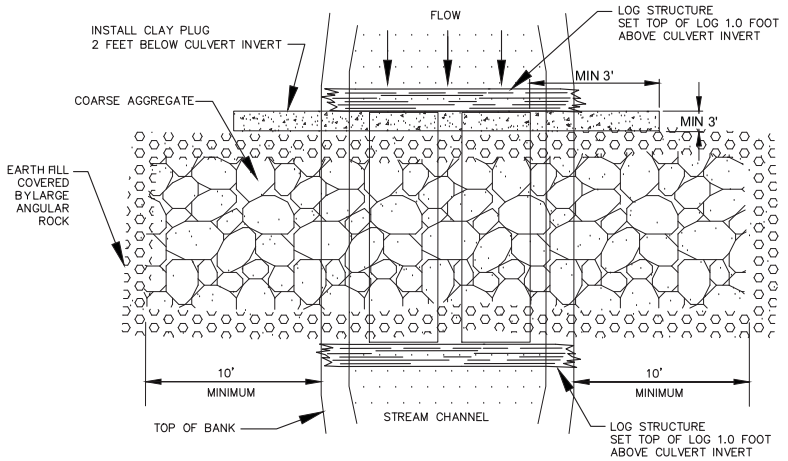
LIVE CUTTINGS BUNDLE

NTS

ELEVATION



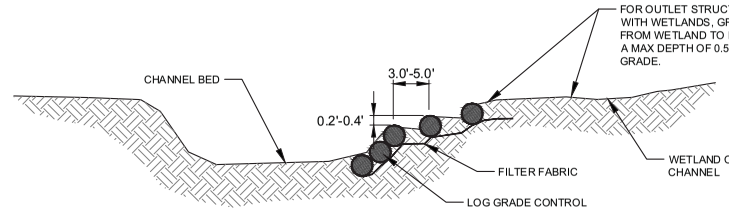
PLAN



NOTES:
1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. INSTALL STREAM CROSSING PERPENDICULAR TO FLOW.
3. CONTRACTOR TO COORDINATE APPROPRIATE BEDDING MATERIAL WITH MANUFACTURER.
4. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.
5. WIDTH OF TYPICAL FARM CROSSINGS SHALL BE PER PLAN OR A MINIMUM OF 12'.
6. WHEN REQUIRED, CONTRACTOR TO ENSURE PIPE MATERIAL AND COVER MEET H–20 LOADING REQUIREMENTS.

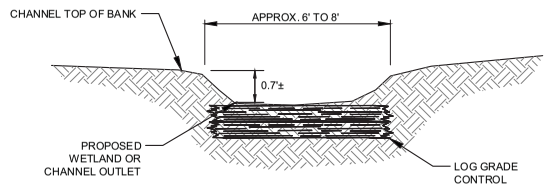
PROPOSED CULVERT CROSSING

NTS



PROFILE VIEW

NOTES:
1. LOGS SHOULD BE AT LEAST 12 INCHES IN DIAMETER, A MINIMUM OF 15 FEET IN LENGTH (UNLESS OTHERWISE NOTED), OAK SPECIES, AND RELATIVELY STRAIGHT.
2. NAIL FILTER FABRIC USING 3" 10D GALVANIZED COMMON NAIL EVERY 2' ALONG THE LOG.
3. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.



SECTION VIEW

LOG OUTLET STRUCTURE

NTS

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Urban Development + Geomatics
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www.wkdickson.com
NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= NTS
0 NTS NTS
2" = FULL SCALE
1" = HALF SCALE

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR: ----

PLOT DATE: 4/4/2014

PROJECT NAME: CEDAR CREEK STREAM AND WETLAND MITIGATION SITE SAMPSON CO, NORTH CAROLINA

DRAWING TITLE: DETAILS

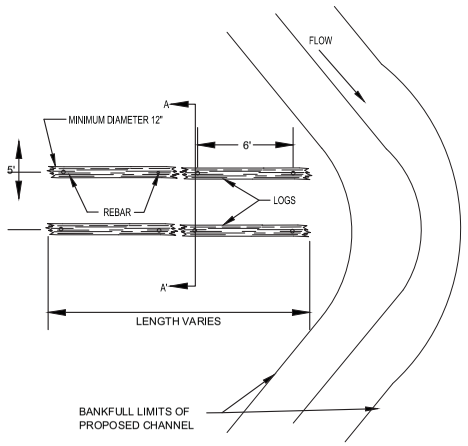
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER: D3

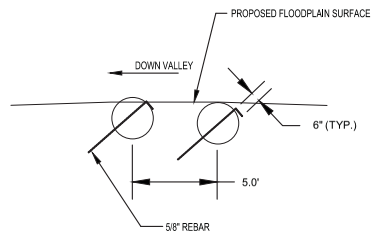
PROJ. NO.: 2013000100.RA

FILE NAME:



PLAN VIEW

NOTE:
REBAR (1/2" MINIMUM DIAMETER 3' MIN. LENGTH TYPICAL) SHOULD BE PLACED 1' TO 3' FROM END OF LOG. ADDITIONAL REBAR TO BE PLACED AT 6' OFFSETS. LAST REBAR SHOULD BE PLACED 1' TO 3' FROM END OF LOG. DUCK BILL ANCHORS MAY BE USED AS A SUBSTITUTION FOR REBAR, 2 PER LOG.



SECTIONAL VIEW A - A'

FLOODPLAIN SILL

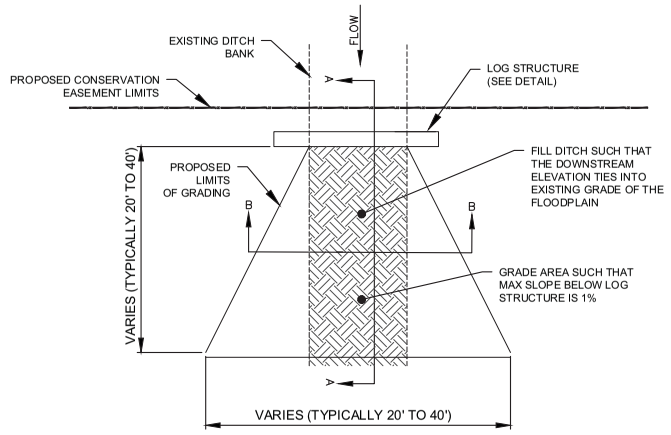
NTS

SIGN SPECIFICATIONS:
- MATERIAL: ALUMINUM
- GAUGE: .032
- SIZE: 6" X 6"
- BACKGROUND COLOR: COATED CHROME YELLOW
- PRINT COLOR: BLACK
- MOUNTING HOLES: 2 HOLES CENTER TOP AND BOTTOM 3/8" DIAMETER 6" ON CENTER AND 2 HOLES CENTER TOP AND BOTTOM 3/16" DIAMETER 7 3/8" ON CENTER
- ROUND CORNERS: 1/4" RADIUS

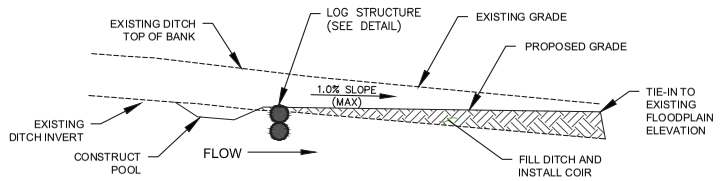
NOTES:
1. CONSERVATION AREA SIGNS SHALL BE ATTACHED TO A TREE, T-POST, U-CHANNEL POST, OR SQUARE STEEL POST.
2. ALL POSTS MUST HAVE A LENGTH OF 6.0 FEET AND BE BURIED TO A DEPTH OF 2.0 FEET.
3. SIGNS SHALL BE INSTALLED ON POSTS USING ¾" ALUMINUM DRIVE RIVETS.
4. THE TOP 0.5 FEET OF T-POSTS OR U-CHANNEL POSTS SHALL BE PAINTED YELLOW.
5. USE 3½"ALUMINUM NAILS TO INSTALL SIGN ON TREES, LEAVING ½" OF THE NAIL EXPOSED.

CONSERVATION EASEMENT SIGN

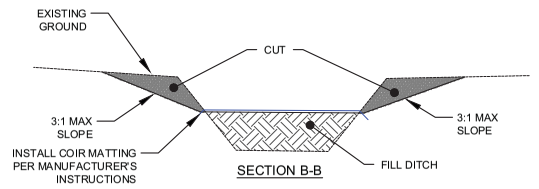
NTS



PLAN VIEW



SECTION A-A

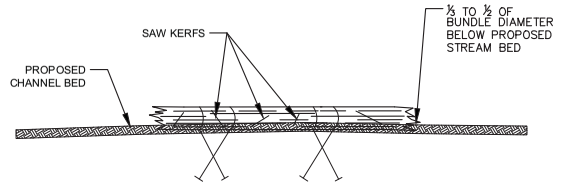


SECTION B-B

NOTES:
1. NO FLOODPLAIN GRADING IS ALLOWED WITHIN 10 FT OF THE PROPOSED CHANNEL TOP OF BANK.
2. LOGS SHOULD BE AT LEAST 10'-20' LONG AND AT LEAST 8 INCHES IN DIAMETER, AND HARDWOOD.

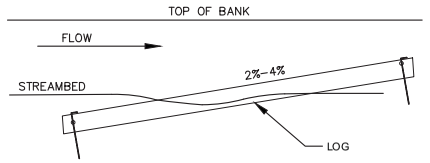
DIFFUSE FLOW STRUCTURE

NTS



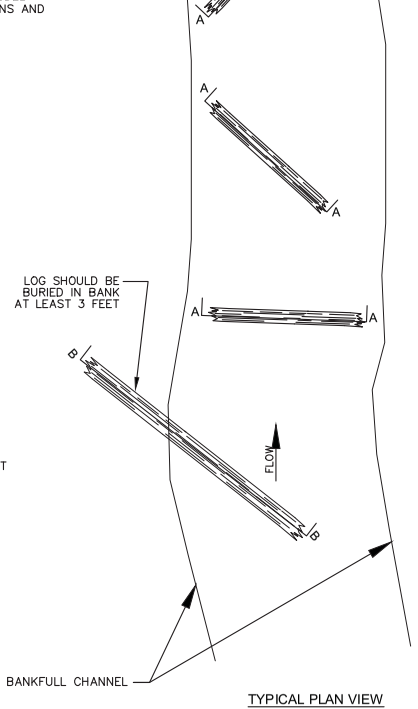
NOTES:
1. USE LOGS OF VARYING SIZES 6"–15" DIAMETER AND 4'–8' LONG. LOGS SHALL BE HELD IN PLACE WITH REBAR OR DUCKBILL ANCHORS, MODEL 68–DB1 OR EQUIVALENT, AND PLACED ACCORDING TO DESIGN PLANS AND AS DIRECTED BY ENGINEER.
2. ALL LOGS SHALL BE "ROUGHED UP" WITH A CHAINSAW PRIOR TO INSTALLATION. SAW KERFS SHALL BE 0.25" TO 2.0" IN DEPTH.

TYPICAL SECTION A-A



NOTES:
1. LOGS SHOULD BE AT LEAST 6 INCHES IN DIAMETER, 10 TO 16 FEET LONG, RELATIVELY STRAIGHT, AND HARDWOOD.
2. LOG ARMS SHOULD BE BURIED INTO THE BANK AND BED A MINIMUM OF 3 FEET.
3. SET ELEVATION OF TOP OF LOG CROSS PIECES TO DESIRED ELEVATION OF PROPOSED GROUND OR STREAMBED.
4. REBAR (5/8" MINIMUM DIAMETER 3' MIN. LENGTH TYPICAL) SHOULD BE PLACED 1' TO 3' FROM END OF LOG. ADDITIONAL REBAR TO BE PLACED AT 5' OFFSETS. LAST REBAR SHOULD BE PLACED 1' TO 3' FROM END OF LOG. DUCK BILL ANCHORS MAY BE USED AS A SUBSTITUTION FOR REBAR.
5. PRE–DRILL HOLES FOR REBAR WITH 5/8" DRILL BIT.
6. DRIVE REBAR THROUGH LOGS AND BEND ENDS AS SHOWN.

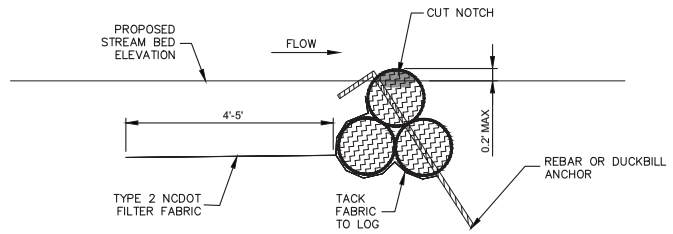
TYPICAL SECTION B-B



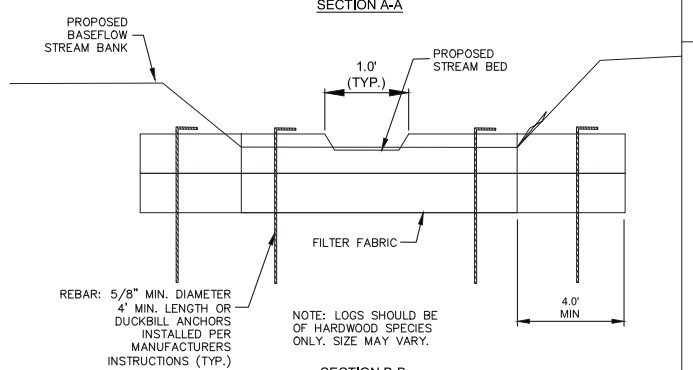
TYPICAL PLAN VIEW

LARGE WOODY DEBRIS

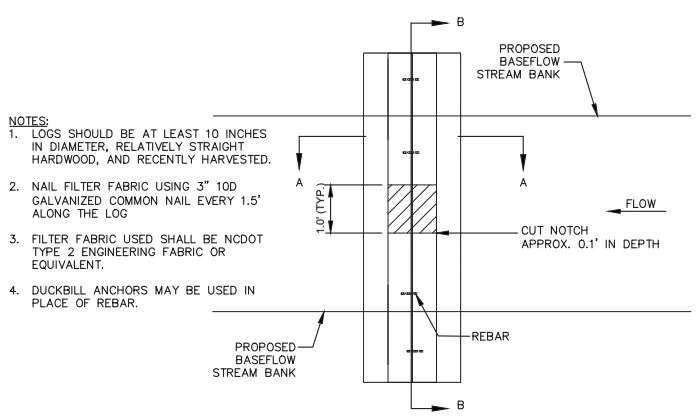
NTS



SECTION A-A



SECTION B-B

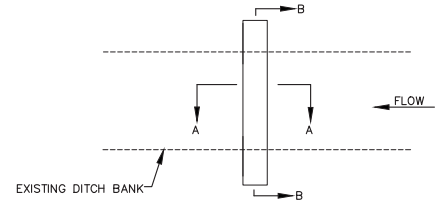


NOTES:
1. LOGS SHOULD BE AT LEAST 10 INCHES IN DIAMETER, RELATIVELY STRAIGHT HARDWOOD, AND RECENTLY HARVESTED.
2. NAIL FILTER FABRIC USING 3" 10D GALVANIZED COMMON NAIL EVERY 1.5' ALONG THE LOG
3. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.
4. DUCKBILL ANCHORS MAY BE USED IN PLACE OF REBAR.

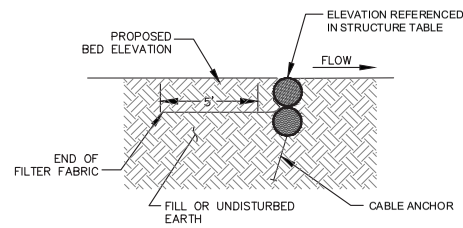
TYPICAL PLAN VIEW

LOG DROP STRUCTURE

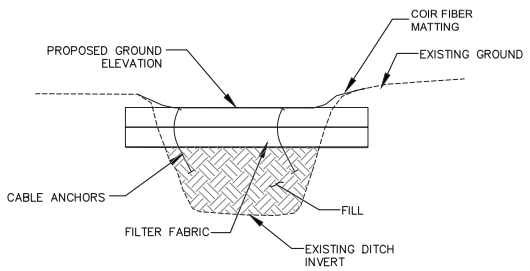
NTS



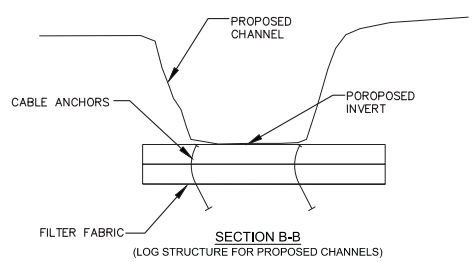
PLAN VIEW



SECTION A-A



SECTION B-B
(LOG STRUCTURE FOR DIFFUSE FLOW STRUCTURE)



SECTION B-B
(LOG STRUCTURE FOR PROPOSED CHANNELS)

1. LOGS SHOULD BE AT LEAST 10 INCHES IN DIAMETER, HARDWOOD SPECIES (EXCLUDING TULIP POPLAR AND SWEET GUM), A MINIMUM OF 10 TO 20 FEET IN LENGTH (UNLESS OTHERWISE NOTED), AND RELATIVELY STRAIGHT.
2. NAIL FILTER FABRIC USING 3" 10D GALVANIZED COMMON NAIL EVERY 3' ALONG THE LOG.
3. FILTER FABRIC USED SHALL BE NCDOT TYPE 2 ENGINEERING FABRIC OR EQUIVALENT.

LOG STRUCTURE

NTS

WK DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
www.wkdickson.com
NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= 30
0 30 60
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

MARK	DATE	DESCRIPTION
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REVISIONS:

RELEASED FOR:

PROJECT NAME:
CEDAR CREEK STREAM AND WETLAND MITIGATION SITE
SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
DETAILS

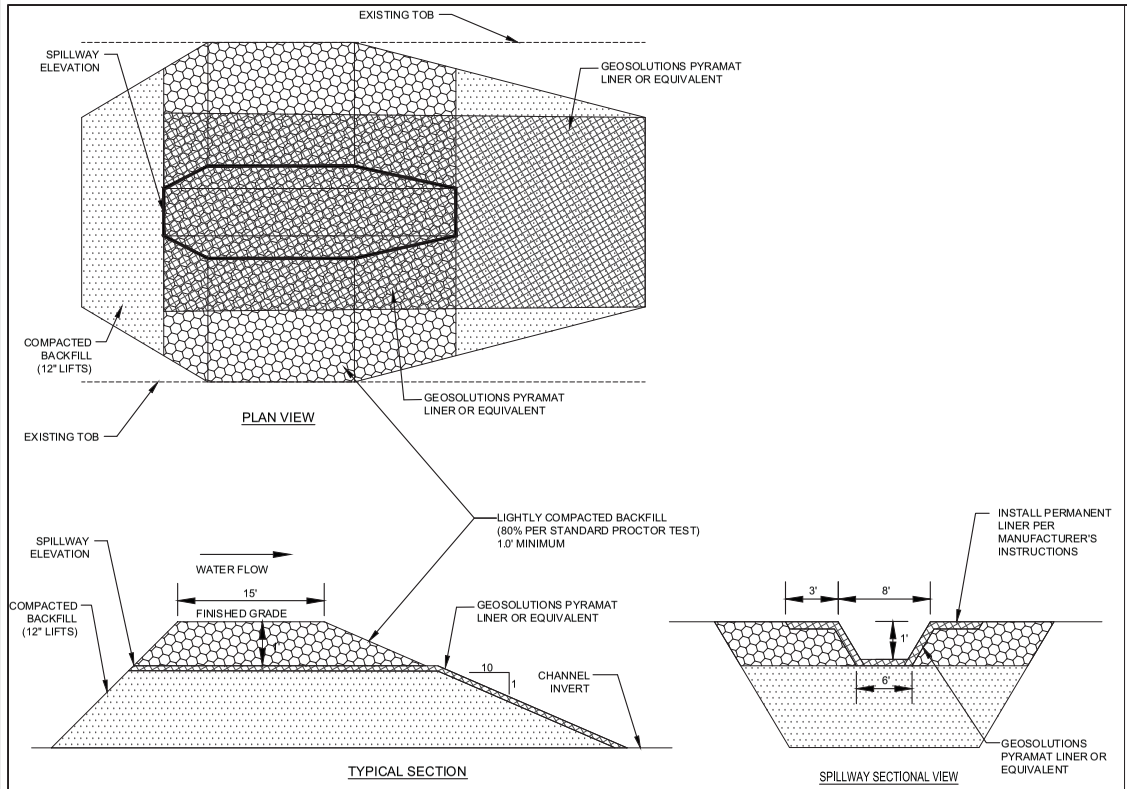
OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
D4

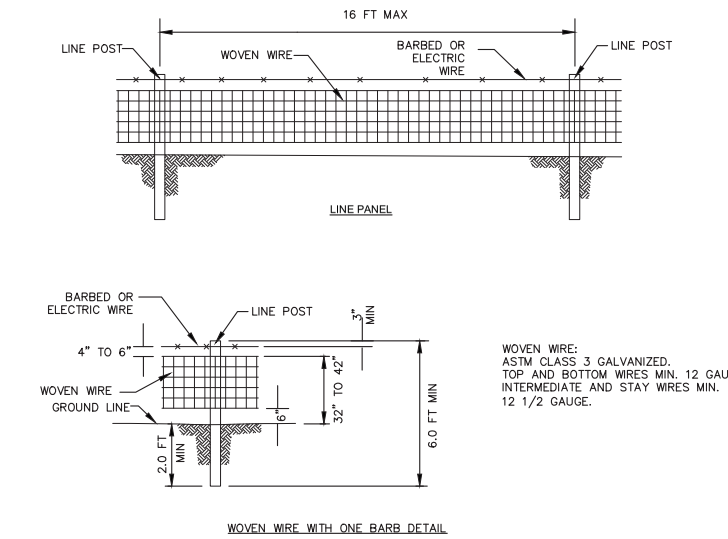
PROJ. NO.:
2013000100.RA

FILE NAME:



CHANNEL PLUG WITH SPILLWAY

NTS



WOVEN WIRE:
ASTM CLASS 3 GALVANIZED.
TOP AND BOTTOM WIRES MIN. 12 GAUGE.
INTERMEDIATE AND STAY WIRES MIN. 12 1/2 GAUGE.

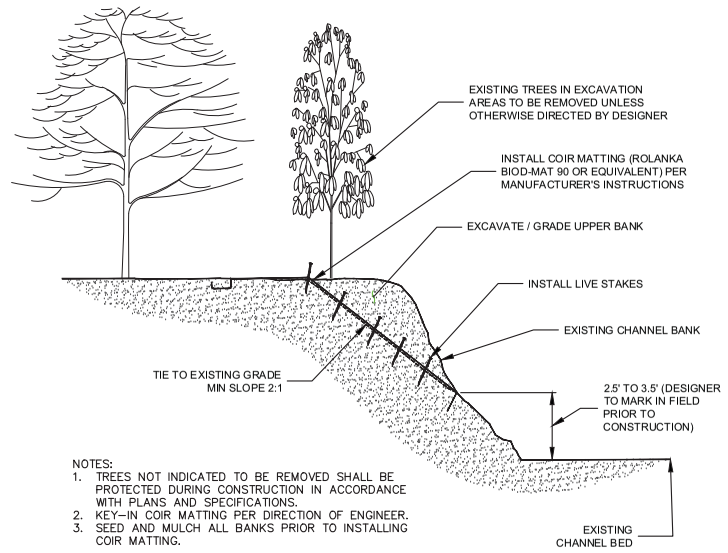
LINE POSTS (WOODEN): MIN. 4 IN. DIAM. OR 4 IN. SQUARE.

LINE POSTS (STEEL): STUDDED OR PUNCHED T, U, OR Y SHAPED, WITH ANCHOR PLATES.
MIN. WEIGHT 1.3 LBS./FT. (EXCLUDING ANCHOR PLATE). POSTS SHALL BE DRIVEN A MINIMUM OF 18" DEEP AND MUST BE AT LEAST 5.5 FT IN LENGTH

SPECIES AND TREATMENT FOR ALL WOOD: USE UNTREATED DURABLE POSTS OF SPECIES SUCH AS RED CEDAR, BLACK LOCUST OR OSAGE–ORANGE WITH BARK REMOVED, OR NON–DURABLE WOOD THAT IS PRESERVATIVE PRESSURE TREATED (0.40 LBS./CUBIC FOOT CCA, OR EQUIVALENT NON–CCA TREATMENT). DO NOT USE RED PINE.

WOVEN WIRE FENCE (NRCS DETAIL 382A)

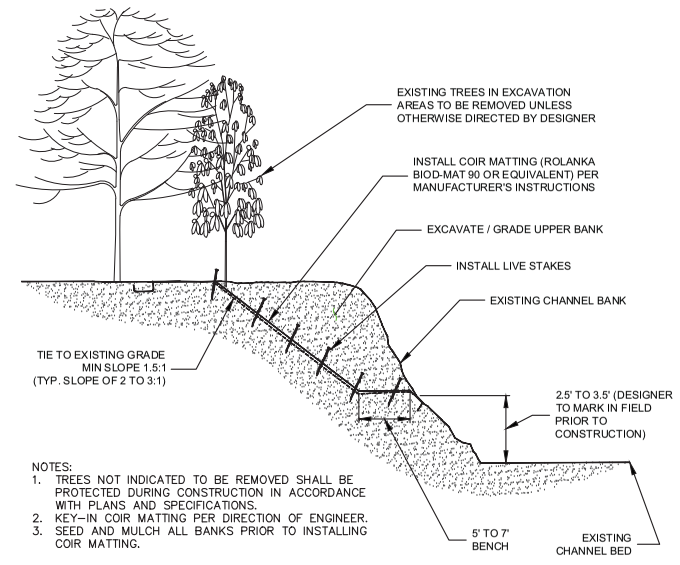
NTS



NOTES:
1. TREES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
2. KEY–IN COIR MATTING PER DIRECTION OF ENGINEER.
3. SEED AND MULCH ALL BANKS PRIOR TO INSTALLING COIR MATTING.

TYPICAL BANK GRADING (OPT 1)

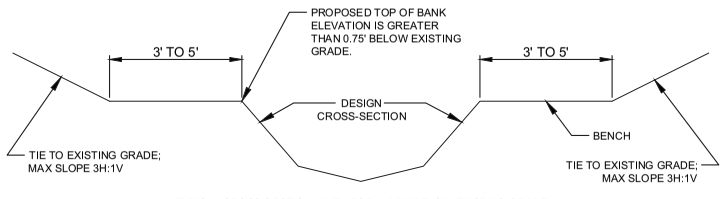
NTS



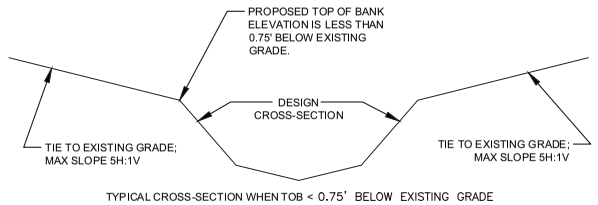
NOTES:
1. TREES NOT INDICATED TO BE REMOVED SHALL BE PROTECTED DURING CONSTRUCTION IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.
2. KEY–IN COIR MATTING PER DIRECTION OF ENGINEER.
3. SEED AND MULCH ALL BANKS PRIOR TO INSTALLING COIR MATTING.

TYPICAL BANK GRADING (OPT 2)

NTS



TYPICAL CROSS-SECTION WHEN TOB ≥ 0.75' BELOW EXISTING GRADE

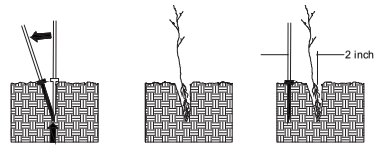


TYPICAL CROSS-SECTION WHEN TOB < 0.75' BELOW EXISTING GRADE

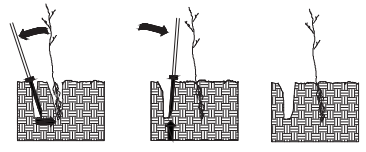
TYPICAL CROSS-SECTION GRADING

NTS

DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. INSERT PLANTING BAR AS SHOWN AND PULL HANDLE TOWARD PLANTER.
2. REMOVE PLANTING BAR AND PLACESEEDING AT CORRECT DEPTH.
3. INSERT PLANTING BAR 2 INCHES TOWARD PLANTER FROM SEEDING.



4. PULL HANDLE OF BAR TOWARD PLANTER, FIRMING SOIL AT BOTTOM.
5. PUSH HANDLE FORWARD FIRMING SOIL AT TOP.
6. LEAVE COMPACTION HOLE OPEN. WATER THOROUGHLY.

PLANTING NOTES:

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

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

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

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

BARE ROOT PLANTING

WK DICKSON
community infrastructure consultants
Transportation + Water Resources
Urban Development + Geomatics
720 Corporate Drive
Raleigh, NC 27607
(v) 919.782.0495
(f) 919.782.9672
www.wkdickson.com
NC. LICENSE NO. F-0374

EBX

FULL SCALE: 1"= NTS
0 NTS NTS
2" = FULL SCALE
1" = HALF SCALE

PLOT DATE: 4/4/2014

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PROJECT NAME:
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SAMPSON CO, NORTH CAROLINA

DRAWING TITLE:
DETAILS

OWNER / 24 HR CONTACT: ENVIRONMENTAL BANC & EXCHANGE, LLC
ADDRESS: 909 CAPABILITY DR, SUITE 3100, RALEIGH, NC 27606
PHONE:
MOBILE:

PROJ. DATE: JAN 2014
Q.C.: FM
Q.C. DATE: ---

DRAWING NUMBER:
D5

PROJ. N0.:
2013000100.RA

FILE NAME: