



MITIGATION PLAN

Final

January 2020

Mangum Homestead Mitigation Site

Orange County, NC
NCDEQ Contract No. 7859
DMS ID No. 100107
DWR No. 2019-0645

Jordan Lake-Upper New Hope
Cape Fear River Basin
HUC 03030002

RFP #: 16-007702

PREPARED FOR:



**NC Department of Environmental Quality
Division of Mitigation Services**

1652 Mail Service Center
Raleigh, NC 27699-1652

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Raleigh, NC 27699-1652

PREPARED BY:



Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203
Phone: (704) 332-7754

This Mitigation Plan has been written in conformance with the requirements of the following:

- 15A NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.
- 15A NCAC 02B .0262 Jordan Water Supply Nutrient Strategy
- 15A NCAC 02B .0240 Nutrient Offset Payments
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

Contributing Staff:

Andrea Eckardt *Project Manager*
John Hutton, *Principal in Charge*
Andrea Eckardt, *Mitigation Plan Development*

Daniel Taylor, *Construction Administrator*
Daniel Dixon, *Monitoring Lead*
Christine Blackwelder, *Lead Quality Assurance*



January 17, 2020

Jeremiah Dow
N.C. Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RE: **DWR Draft Mitigation Plan Comments**
Mangum Homestead Mitigation Site (DMS #100107)
DMS Contract Number 7859
RFP Number 16-007702
Orange County, NC

Dear Mr. Dow:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Water Resources (DWR) comments dated 1/15/2020 for the Draft Mitigation Plan for the Mangum Homestead Mitigation Site. The following Wildlands responses to DWR's report comments are noted in italics lettering.

1. Section 1.0

a. Provide directions to the site

Directions have been added to Section 1.0

b. Page 1, 1st paragraph: Add language to clarify this site is being submitted for buffer and nutrient offset credits in the Upper New Hope Watershed of the Jordan Lake WS instead of the 03030002.

Language was added to the first paragraph on Page 1 to clarify the Site's location in the Upper New Hope Watershed of the Jordan Lake WS.

c. Add a service area map to the Figures. Currently, there is just a vicinity map. The Service area map should show the Upper New Hope WS of Jordan Lake.

Figure 2 now depicts the Site's Service Area. All other figures numbers have been renumbered accordingly.

2. Consistent misuse of the term "riparian buffer" or "buffer" is used throughout the text in Sections 1-10 and can lead to confusion or misleading information. These terms are only to be used to describe the Jordan buffer, which is 0-50' and has a Zone 1 and Zone 2. Please correct terminology where it is being misused and replace with "riparian area" where it applies.

Correct terminology regarding "buffer" and "riparian area" has been replaced throughout the document.

3. Section 2.1, last paragraph: this paragraph should acknowledge that the stream flow on UT2A is impeded due to the existing crossing. DWR noted this as an issue in the stream determination letter. That observation by DWR implies the crossing should be repaired to restore stream flow. Since the crossing is within the CE, hopefully it will be a plausible option.

The impaired flow has been noted in Section 2.1 and plans to correct the issue have been included in Section 6.0



4. **Section 4.0 – I did not see the supporting materials and correspondence provided with the Cat Ex. Can this be provided? Other Mitigation Plans have included this and DWR does appreciate having this information for their review. EDR data was provided.**
Supporting documentation for the Categorical Exclusion has been added to the appendix included the USFWS self-certification letter, the SHPO comment letter, and the AD1006 Form.
5. **Table 5-**
 - a. **This table is missing info. showing the Totals in the upper part of the table. Please add.**
The totals have been added to the table.
 - b. **This table is missing the cell showing the Eligible Preservation. Please add**
Eligible preservation total has been added to the table.
 - c. **UTA is shown as having a max of 100' but the corresponding Figure 7 appears to only go out to a max of 30 or 50'. Please correct so it is not misleading.**
Correction to 0-50' for UT2A has been added.
 - d. **Ephemerals E1, E2, E3 are dedicated to Nutrient Offset in this table... therefore they are not convertible to buffer credits since the 25% cap has not been applied to buffer credits. Correct table by selecting "no" for convertible to buffer.**
E1, E2 and E3 sections have been selected as "no" for convertible to buffer.
 - e. **E3 is shown in the preservation table as being 10:1 but it should be 5:1**
That change was made in the Mitigation Plan document, but the EXCEL spreadsheet was not editable for that section. It still reads as 10:1
6. **Section 6.1 – Identify how the issue with impeded stream flow along UTA at crossing 1 is going to be addressed.**
The existing culvert on UT2A will be cleaned out to allow for flow downstream.
7. **Section 6.2 – Planting with a permanent seed mix that is abundant in annual and perennial pollinator species is strictly voluntary, but is being encouraged by DWR in other mitigation plans to promote diversity and enhance the health of the herbaceous layer, which can also greatly benefit planted stems.**
Noted and will be applied on the project as appropriate.
8. **Section 7.0 – Correct sentence by adding the red text as follows: "The nutrient offset and buffer restoration project will be assigned..."**
Language added to Section 7.0
9. **Section 7.4 – More detail needs to be provided. Provide information on what will be recorded in the plots, will they be rotating or random plots, what size are the plots, do they make up a certain percentage of the planted area? Etc.**
Specific details about the vegetation plots was added to Section 7.1 including size of the plots, placement, and percentage of planted area.
10. **Section 9.0 – Identify how the boundary will be marked at as-built. It says the stewardship program will install signage, but isn't that done at closeout? If so, the provider needs to install their own temporary signs and mark the easement boundary before AsBuilt as to avoid any confusion of where the boundaries are.**
Signage will be installed after the conservation easement is recorded. That step is clarified in Section 3.1 and 9.0



11. Figure 8-

- a. The plot on UT2A needs to be relocated to be in the Buffer Restoration area where buffer credit is being sought. Currently, there is no plot located in an area receiving buffer credits.**

The plot on UT2A was moved to the buffer restoration area as shown on Figure 9

- 12. Overall, if the riparian restoration, enhancement, and preservation is done according to the plan and addresses all comments and correction provided by DWR, the site should provide a good buffer mitigation project.**

- 13. Was there an AD-1006 form required? I didn't see it.**

The AD-1006 form was added to the appendix along with other supporting documentation for the Categorical Exclusion.

Enclosed please find one (1) hard copy of the Final Monitoring Report. Please contact me at 704-332-7754 x101 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Andrea S. Eckardt".

Andrea S. Eckardt
Ecological Assessment Team Leader
aekardt@wildlandseng.com

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APPENDIX

Historical Aerial Photographs
Existing Conditions Photographs
NC Division of Water Resources Site Viability for Buffer Mitigation and Nutrient Offset Letter
NC Division of Water Resources On-Site Determination for Applicability to the Jordan Lake Buffer Rules
Site Protection Instrument
Categorical Exclusion Form – August 27, 2019 and Supporting Documentation
EDR Summary Report



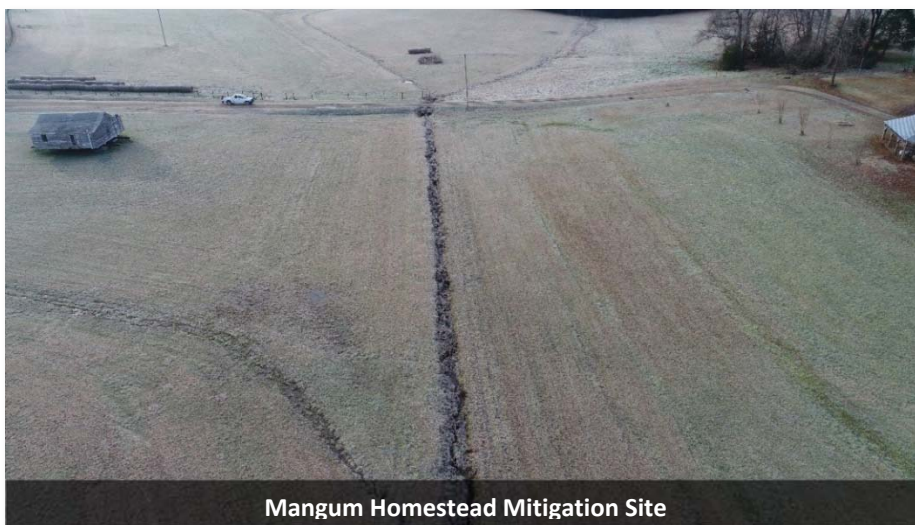
1.0 Introduction

The Mangum Homestead Mitigation Site (Site) is located in Orange County approximately three miles northwest of the Town of Carrboro (Figure 1). The Site involves buffer restoration, enhancement, and preservation on four unnamed tributaries and three ephemeral channels that flow to New Hope Creek upstream of Jordan Lake. The Site is being submitted for buffer mitigation credit and nutrient offset credit in the Cape Fear River Basin HUC 03030002, Upper New Hope Watershed of Jordan Lake in accordance with the Consolidated Buffer Mitigation Rules (15A NCAC 02B .0295), the Jordan Water Supply Nutrient Strategy (15A NCAC 02B .0262) and the Nutrient Offset Payments Rule (15A NCAC 02B .0240). See Figure 2 for the Service Area of the Site.

The project is located within the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002060110, Upper New Hope – Jordan Lake Sub-watershed, and NCDWR Subbasin 03-06-05. Project streams flow approximately one mile to the confluence with New Hope Creek, which is classified as Nutrient Sensitive Waters (NSW) by the North Carolina Division of Water Resources (NCDWR). The project supports specific goals identified in the 2009 Cape Fear River Basin Restoration Priorities Plan (RBRP) by addressing nutrient reductions through buffer restoration and improving habitat for the native mussel species present in the HUC.

The major goals of the nutrient offset and buffer restoration project are to provide ecological and water quality enhancements to Jordan Lake in the Cape Fear River Basin by creating a functional riparian corridor and restoring the riparian area. Specific enhancements to water quality and ecological processes are outlined below in Table 1.

This nutrient offset and riparian buffer restoration project will reduce sediment and nutrient loading, provide and improve terrestrial and in stream habitats, and improve stream and bank stability. The area surrounding the streams and ephemeral channels is currently agricultural fields, typically used to grow hay. Restoring up to 200 feet of vegetative buffer along the streams and channels will remove the crops and fertilizer inputs within the project area. The restored floodplain areas will filter sediment during high rainfall events. The establishment of riparian areas will create shading to minimize thermal heating. Finally, invasive vegetation will be treated within the project area and newly planted native vegetation will provide cover and food for wildlife.



Mangum Homestead Mitigation Site



To reach the Site, traveling east on I-40E/I-85N from Greensboro, keep right at fork to continue on I-40E (follow signs for I-40/Raleigh) (2.4 miles). Take exit 261 (towards Hillsboro) (0.3 miles). Turn right onto Old NC 86 (2.7 miles). Turn right onto Arthur Minnis Rd. (2.3 miles). The site will be on the right.

Table 1: Ecological and Water Quality Goals

Goal	Objective	CU-Wide and RBRP Objectives Supported
Decrease nutrient levels	Nutrient input will be decreased by filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.	Reduce nutrient inputs to waters of the Cape Fear River.
Decrease sediment input	Sediment from off-site sources will be captured by deposition on restored floodplain areas where native vegetation will slow overland flow velocities.	Reduce sediment inputs to waters of Cape Fear River.
Decrease water temperature and increase dissolved oxygen concentrations	Establishment and maintenance of riparian areas will create additional long-term shading of the channel flow to reduce thermal pollution.	Improve habitat to wildlife by providing additional habitat.
Reduction of peak flows	Establishment of a riparian area will slow flood flows and allow for greater infiltration, reducing peak flows downstream.	Restoration of degraded riparian areas.
Create appropriate terrestrial habitat	Buffer areas will be restored by removing invasive vegetation and planting native vegetation.	Restoration of degraded riparian areas.
Permanently protect the project Site from harmful uses.	Establish a conservation easement on the Site will protect the riparian corridor in perpetuity.	Protect aquatic habitat; protect water supply waters

Table 2: Buffer Project Attributes

Project Name	Mangum Homestead Mitigation Site
Hydrologic Unit Code	03030002060110
River Basin	Cape Fear
Geographic Location (Lat, Long)	35° 59' 49.23" N, 79° 8' 44.77" W
Site Protection Instrument (DB, PG)	To be recorded
Total Credits (Riparian Buffer), Total Credits (Nutrient Offset)	35,428.000 ft ² , 19,981.445 lbs. N, 1,259.513 P
Types of Credits	Riparian Buffer, Nutrient Offset Credit
Mitigation Plan Date	January 2019
Initial Planting Date	March 2020
Baseline Report Date	May 2020
MY1 Report Date	December 2020
MY2 Report Date	December 2021
MY3 Report Date	December 2022

MY4 Report Date	December 2023
MY5 Report Date*	December 2024

*Meets success criteria (schedule progression has been developed assuming that the site meets success criteria each monitoring year)

2.0 Mitigation Project Summary

The major goals of the buffer restoration project are to provide ecological and water quality enhancements to Jordan Lake in the Cape Fear River Basin by creating a functional riparian corridor and restoring the riparian area. Specific enhancements to water quality and ecological processes are outlined in Table 1. The major attributes and timeline of the project are outlined in Table 2.

The following sections describe the Site in terms of the existing site conditions, watershed, soils, geology, vegetation, site constraints, current site resources and historic resources.

2.1 Existing Site Conditions

The buffer restoration site is approximately 19.89 acres of primarily agricultural fields located on the Mangum Family Homestead. The project includes the restoration, enhancement, and preservation of riparian areas along four unnamed tributaries and three ephemeral channels: UT to New Hope Creek, UT1, UT2, UT2A and E1-E3 (Figure 3). While UT to New Hope Creek, UT1, and E3 have areas of established forested vegetation, UT2, UT2A, and E1-E2 are mowed regularly with no existing riparian area. Historically, the Site was used for cattle, but its current use is predominantly agricultural fields for hay production. The family has donkeys and goats on the property, but their access is currently restricted to UT2A. Historical aerials from 1938 through 2016 are included in the Appendix and further document the Site’s long history of agricultural use.

The Site is characterized by gently sloped valleys dominated by agricultural fields. UT to New Hope Creek flows east through the Site in an established riparian area. While the right bank maintains a forested buffer, the left bank opens to agricultural fields. E1 enters the Site through a small pipe below a pond, flowing north through the agricultural fields into UT2 just upstream of the existing driveway. E2 enters the project parcels from a mature forest off the project parcels, flowing northwest through the agricultural fields into UT2, also at the confluence with E1. E3 enters the project parcels from a mature forest and flows south into UT1. UT1 then flows for approximately 150 into UT to New Hope Creek. E3 is buffered by a strip of mature trees extending out 20-50 feet. UT2A is an intermittent stream that begins in the open agricultural field and flows north between multiple barns structures to join UT2. UT2A flows through a culvert crossing that is currently impairing the stream flow, per the DWR stream determination letter. A current photolog is included in the Appendix.

2.2 Watershed Characterization

The Site is located within the Targeted Local Watershed 03030002060110 and NCDWR Subbasin 03-06-05. The project streams flow to New Hope Creek which is classified as WS-V and NSW by NCDWR. Class WS-V waters are upstream water supply waters generally draining to WS-IV waters and are protected for Class C uses (recreational use, agriculture, fishing and fish consumption, and the maintenance of biological integrity for wildlife). The NSW designation applies to surface waters that are experiencing excessive growths of microscopic or macroscopic vegetation.

The Site topography, as indicated on the White Cross, NC USGS 7.5-minute topographic quadrangle, shows gently sloped areas throughout the Site (Figure 4). Land uses draining to the project reaches are primarily forested with some agricultural and residential use (Figure 5). The watershed areas and current land use are summarized in Table 3, below.

Table 3 Drainage Areas and Associated Land Use

Reach Name	DWR Stream Type	Watershed Area (acres)	Land Use
UT to New Hope Creek	Perennial	491	73% forested; 19% agriculture; 4% developed; 2% grassland; 1% shrub; 1% open water
UT1	Intermittent	15	
UT2	Intermittent	105	
UT2A	Intermittent	9	
E1	Ephemeral	28	
E2	Ephemeral	33	
E3	Ephemeral	15	

2.3 Soils

The project site is mapped by the Orange County Soil Survey. Project area soils are mapped primarily as Enon loam, Chewacla, Wilkes gravelly loam, and Georgeville silt loam. These soils are described below in Table 4. An image of the paper copy of the 1977 Soil Survey of Orange County is provided in Figure 6.

Table 4 Project Soil Types and Descriptions

Soil Name	Description
EnB – Enon Loam, 2 to 6% slopes	Enon loam consists of very deep, well drained, slowly permeable soils on gently sloping ridgetops (EnB) and moderate backslopes (EnC). Water capacity is moderately low to moderately high. Surface runoff is low to medium.
EnC – Enon Loam, 6 to 12% slopes	
Ch – Chewacla, 0 to 2% slopes	Chewacla consists of very deep, moderately permeable soils on toeslopes and floodplains. These soils are frequently flooded and somewhat poorly drained. Water capacity is moderately high to high. Surface runoff is negligible to low.
WxD – Wilkes Gravelly Loam, 8 to 15% slopes	Wilkes gravelly loam consists of shallow, well drained soils on moderate to steep backslopes. Permeability is moderately slow to slow, and surface runoff is medium to high. Water capacity is very low to low.
WxF – Wilkes Gravelly Loam, 15 to 45% slopes	
GeC – Georgeville Silt Loam, 6 to 12% slopes	Georgeville silt loam consists of very deep, well drained, moderately permeable soils on gently sloping ridgetops, shoulders, and backslopes. Water capacity is moderately high to high. Surface runoff is medium.

Source: Orange County Soil Survey, USDA-NRCS, https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/north_carolina/orangeNC1977/map22.pdf

2.4 Geology

The Site is located in the Carolina Slate Belt of the Piedmont physiographic province. The landscape of the Piedmont is characterized by gently rolling, well-rounded hills with long low ridges, with elevations ranging anywhere from 300 to 1,500 feet above sea level. The Carolina Slate Belt consists of heated and deformed volcanic and sedimentary rocks. Approximately 550 to 650 million years ago, this region was the site of a series of oceanic volcanic islands (NCGS, 2018). According to the Geologic Map of North Carolina (1985), the underlying geology of the Site is mapped as late Proterozoic to Cambrian age felsic metavolcanic rock (CZfv). The unit is described as metamorphosed dacitic to rhyolitic flow and tuffs that

is light gray to greenish gray in color and is interbedded with mafic and intermediate metavolcanics rock, meta-argillite, and metamudstone.

2.5 Vegetation

Vegetation communities within the project area are primarily comprised of open pastures dominated by various graminoid species. Except for a few small areas of mixed hardwood forest, the Site has been regularly mowed and maintained up to the project features and lacks canopy, understory, and shrub vegetative layers.

The areas of existing hardwood bottomland forest exist in a thin strip adjacent to UT to New Hope Creek, UT1 and E3 as well as a larger section along the confluence of UT to New Hope Creek and UT2. These forested areas exhibit mature canopy tree species with a moderate understory shrub and vine layer. These areas are in good condition and show no evidence of recent maintenance or vegetation disturbances. Canopy hardwood species include sugarberry (*Celtis laevigata*), eastern red cedar (*Juniperus virginiana*), black walnut (*Juglans nigra*), tulip-poplar (*Liriodendron tulipifera*), umbrella tree (*Magnolia tripetala*), American elm (*Ulmus americana*), black willow (*Salix nigra*), and sweetgum (*Liquidambar styraciflua*).

2.6 Site Constraints and Access

The Site is accessible for construction, monitoring, and long-term stewardship from Arthur Minnis Road (Figure 3). There are four culverted crossings that will be internal conservation easement crossings. These internal crossings are included in the conservation easement boundary but are not included in credit calculations: crossing number 1 is on UT2A, crossing number 2 is on UT to New Hope Creek, and crossings 3 and 4 are on UT2. Two existing utility poles shown on Figure 3 will be relocated and realigned within crossing 3 (Figure 7).

Existing fencing within the easement boundary will be removed and/or relocated to keep livestock out of the easement. There is a large deer stand on the property, shown on Figure 3 that is adjacent to, but outside of the conservation easement boundary.

2.7 Current Site Resources

On July 19, 2019 NCDWR conducted on-site determinations to review features and land use within the project boundary. The resulting NCDWR site viability letter and map confirmed the seven project features on the Site are suitable for riparian buffer credit pursuant to 15A NCAC 02B .0295 and for nutrient offset mitigation per 15A NCAC 02B .0240. NCDWR also reviewed the Site for its applicability to the Jordan Riparian Area Protection Rules (15A NCAC 02B .0267). Both letters from NCDWR are included in the Appendix.

2.8 Historic Site Resources

The Site has historically been used for agricultural purposes. Historic aerial photos are included in the Appendix and date back to 1938, showing the site in various stages of timber clearing, row crop production, and cattle pasture.

3.0 Site Protection Instrument

3.1 Site Protection Instruments Summary Information

The land required for buffer planting, management, and stewardship of the mitigation project includes portions of the parcels listed in Table 5. The conservation easement on this property has not yet been recorded. A copy of the draft land protection instrument is included in the Appendix.



Table 5: Site Protection Instrument

Landowner	PIN	County	Site Protection Instrument	Deed Book and Page Number	Acreage to be Protected
Janie B. Mangum and Robert W. Mangum	9851671991 9851763367 9851778621	Orange	Conservation Easement	To Be Recorded	19.89

3.2 Current Ownership and Long-Term Protection

The Site is located on three parcels owned by Janie B. Mangum and Robert W. Mangum. An option agreement for the project area shown on the Figures have been signed by the property owners and a Memorandum of Option has been recorded at the Orange County Register of Deeds. The option agreement allows restriction of the land use in perpetuity through a conservation easement. Wildlands will convey the conservation easement to the State to provide long-term protection of the Site. The conservation easement agreement will ensure the right of entry abilities of Wildlands, its contractors, and the future easement holder in any future land transactions. Once the conservation easement has been recorded, easement boundaries will be identified in the field to ensure clear distinction between the Site and adjacent areas. Boundary markers that have been disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.

4.0 Regulatory Considerations

Table 6, below, is a summary of regulatory considerations for the Site. These considerations are expanded upon in Sections 4.1-4.4. A copy of the signed Categorical Exclusion Form for the project is included in the Appendix.

Table 6: Project Attribute Table

Regulatory Considerations			
Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	No	N/A	N/A
Water of the United States - Section 401	No	N/A	N/A
Endangered Species Act	Yes	Yes	Appendix (Categorical Exclusion)
Historic Preservation Act	Yes	Yes	Appendix (Categorical Exclusion)
Coastal Zone Management Act	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

4.1 Threatened and Endangered Species

The NC Natural Heritage Program (NHP) database and the US Fish and Wildlife Service (USFWS) database were searched for federally listed threatened and endangered plant and animal species in Orange County, NC. The Orange County listed endangered species includes the Atlantic pigtoe (*Fusconaia masoni*), the Michaux's sumac (*Rhus michauxii*), and the Smooth coneflower (*Echinacea laevigata*). The USFWS lists Critical Habitat Designations for federally listed species, which includes the Atlantic pigtoe. However, the project location is outside the USFWS defined Critical Habitat



Designations. No Critical Habitat Designations are listed by the USFWS for the Michaux's sumac or the Smooth coneflower.

As a result of a pedestrian survey conducted on June 19, 2019, no individual species, suitable habitat or critical habitat were found to exist for the Michaux's sumac, smooth coneflower or the Atlantic pigtoe. The survey was conducted during the blooming season for both of the endangered vascular plants; therefore, Wildlands is confident with the determination of "no effect" on the two listed plant species.

A self-certification letter was submitted through the USFWS Information for Planning and Consultation database (IPaC) requesting comment from USFWS dated July 5, 2019. No response from the USFWS was received within the 45-day response period. Therefore, Wildlands assumes USFWS has no comments regarding associated laws and does not have any information relevant to the project at the current time. The approved Categorical Exclusion form and the self-certification letter for the project is included in the Appendix.

4.2 Cultural Resources and Significant Natural Heritage Areas

The National Historic Preservation Act declares a national policy of historic preservation to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and Section 106 mandates that federal agencies take into account the effect of an undertaking on a property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

There are no existing structures in the project easement area. The Site is not located near any sites listed on the National Register with the State Historic Preservation Office (SHPO). SHPO commented on April 12, 2019 and "was aware of no historic resources that would be affected by the project". The approved Categorical Exclusion form and correspondence from SHPO for the project is included in Appendix.

4.3 FEMA Floodplain Compliance

The Site is not located in a FEMA floodplain. No grading activities are planned for the floodplain, so a floodplain development permit will not be required. No hydraulic modeling is planned for this project.

4.4 Other Environmental Issues

An EDR Radius Map Report with GeoCheck was ordered for the Site through Environmental Data Resources, Inc. on December 11, 2018. The target property and the adjacent properties are not listed in any of the Federal, State, or Tribal environmental databases searched by EDR. There were no known or potential hazardous waste sites identified within one mile of the Site. The executive summary of the EDR report is included in the Appendix.



5.0 Determination of Credits

The Site is a riparian restoration, enhancement, and preservation site with 19,981.445 pounds of nutrient offset credits (nitrogen), 1,259.513 pounds of phosphorus and 35,428.000 square feet of riparian buffer credits (Tables 7 and 8 and Figure 7). The mitigation credit calculation was derived based on Wildlands' conceptual design for maximum ecological uplift. The buffer zones and subject and non-subject stream designations are shown on Figure 8. The management objectives, mitigation type, and amount of buffer mitigation are presented below.

Table 7: Project Mitigation Credits

Cape Fear - Jordan Upper New Hope 03030002060110						Service Area										
32.91899						N Credit Ratio (sf/credit)										
522.2408						P Credit Ratio (sf/credit)										
Credit Type	Location	Subject	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area of Buffer Mitigation (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-50	UT2A	24,748	24,748	1	100%	1.00000	Yes	24,748.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement	0-50	UT2A	4,836	4,836	2	100%	2.00000	Yes	2,418.000	No	—	—
Nutrient Offset	Rural	Yes	I / P	Restoration	0-100	UT2A	5,740	5,740	1	100%	1.00000	Yes	5,740.000	Yes	174.367	10.991
Nutrient Offset	Rural	Yes	I / P	Restoration	0-100	UT2	173,884	173,884	1	100%	1.00000	Yes	173,884.000	Yes	5,282.179	332.958
Nutrient Offset	Rural	Yes	I / P	Restoration	101-200	UT2	23,413	23,413	1	33%	3.03030	Yes	7,726.298	Yes	711.231	44.832
Nutrient Offset	Rural	No	Ephemeral	Restoration	0-100	E1	51,605	51,605	1	100%	1.00000	No	—	Yes	1,567.636	98.815
Nutrient Offset	Rural	No	Ephemeral	Restoration	101-200	E1	3,077	3,077	1	33%	3.03030	No	—	Yes	93.472	5.892
Nutrient Offset	Rural	No	Ephemeral	Restoration	0-100	E2	76,031	76,031	1	100%	1.00000	No	—	Yes	2,309.640	145.586
Nutrient Offset	Rural	No	Ephemeral	Restoration	101-200	E2	4,538	4,538	1	33%	3.03030	No	—	Yes	137.854	8.689
Nutrient Offset	Rural	No	Ephemeral	Restoration	0-100	E3	72,571	72,571	1	100%	1.00000	No	—	Yes	2,204.533	138.961
Nutrient Offset	Rural	No	Ephemeral	Restoration	101-200	E3	36,263	36,263	1	33%	3.03030	No	—	Yes	1,101.583	69.437
Buffer	Rural	Yes	I / P	Restoration	0-100	UT1	7,041	7,041	1	100%	1.00000	Yes	7,041.000	Yes	213.889	13.482
Nutrient Offset	Rural	Yes	I / P	Restoration	101-200	UT1	6,205	6,205	1	33%	3.03030	Yes	2,047.652	Yes	188.493	11.881
Nutrient Offset	Rural	Yes	I / P	Restoration	0-100	UT to New Hope Creek	119,850	119,850	1	100%	1.00000	Yes	119,850.000	Yes	3,640.756	229.492
Nutrient Offset	Rural	Yes	I / P	Restoration	101-200	UT to New Hope Creek	84,592	84,592	1	33%	3.03030	Yes	27,915.388	Yes	2,569.702	161.979
Totals							694,394	694,394								
Eligible for Preservation (sf):								12,208								

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (sf)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
Buffer	Rural	Yes	I / P	Preservation	0-100	UT to New Hope Creek	55,269	12,207	10	100%	10.00000	1,220.700
Buffer	Rural	Yes	I / P	Preservation	101-200	UT to New Hope Creek	5,485		10	33%		—
Buffer	Rural	Yes	I / P	Preservation	0-100	UT1	1,815		10	100%		—
Buffer	Rural	Yes	I / P	Preservation	0-100	UT2	10,902		10	100%		—
Buffer	Rural	No	Ephemeral	Preservation	0-100	E3	12,349		5	100%		—

Table 8: Total Area of Mitigation

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals	Square Feet	Credits	
Restoration:	31,789	31,789.000	
Enhancement:	4,836	2,418.000	
Preservation:	12,207	1,221.000	
Total Riparian Buffer:	48,832	35,428.000	
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals	Square Feet	Credits	
Nutrient Offset:	657,769	Nitrogen:	19,981.445
		Phosphorus:	1,259.513

15A NCAC 02B .0295 (o)(5) - Preservation Area is 25% of Total Buffer Mitigation Area

15A NCAC 02B 0295 (o)(7) - Ephemeral Reaches are 0% of the Total Buffer Mitigation Area

6.0 Mitigation Work Plan

The Wildlands Team proposes to restore a high quality of ecological function to riparian areas of UT to New Hope Creek, UT1, UT2, UT2A, E1, E2, and E3 on the Site. The ecological uplift can be summarized as transforming an agriculturally impacted area to a protected riparian corridor. The project design will ensure that no adverse impacts to wetlands or existing riparian buffers occur. Figure 7 illustrates the conceptual design for the Site. Figure 8 depicts the riparian buffer zones (30 feet, 50 feet, 100 feet and 200 feet). Figure 8 also identifies whether the project streams are subject to the buffer rules, based on the DWR On-Site Determination for Applicability to the Jordan Buffer Rules.

6.1 Parcel Preparation

The land proposed for buffer restoration is used for agricultural fields. These areas will be tilled with a chisel plow to reduce soil compaction prior to planting. The fields within the project area contain few weeds and will likely only require some selective spot herbicide treatments. Any ephemeral ditches or swales entering the proposed buffer areas that are not being buffered themselves will have the flow disconnected and will be spread level through the buffer area for maximum nutrient treatment. Any existing fencing within the conservation easement boundary will be removed or relocated outside of the conservation easement boundary (Figure 7). The existing culvert on UT2A will be cleaned out to restore stream flow.

6.2 Riparian Area Restoration Activities

The revegetation plan for the buffer restoration area will include permanent seeding, planting bare root trees, live stakes, and herbaceous plugs. These revegetation efforts will be coupled with controlling invasive species population. The specific species composition to be planted was selected based on the community type, observation of occurrence of species in riparian areas adjacent to the Site, and best professional judgement on species establishment and anticipated site conditions in the early years following project implementation. Tree species planted across the buffer areas of the site will include a mixture of the species listed in Table 9 below:

Table 9: Selected Tree Species

Species	Common Name	Density
<i>Quercus phellos</i>	Willow Oak	10%
<i>Platanus occidentalis</i>	Sycamore	25%
<i>Betula nigra</i>	River Birch	20%
<i>Populus deltoides</i>	Eastern Cottonwood	15%
<i>Quercus michauxii</i>	Swamp Chestnut Oak	15%
<i>Diospyros virginiana</i>	American Persimmon	10%
<i>Acer negundo</i>	Boxelder	5%

Trees will be planted at a density sufficient to meet the performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years of monitoring. No one tree species will be



greater than 50% of the established stems. An appropriate seed mix will also be applied as necessary to provide temporary ground cover for soil stabilization and reduction of sediment loss during rain events in disturbed areas. This will be followed by an appropriate permanent seed mixture.

Vegetation management and herbicide applications may be needed during tree establishment in the restoration areas to prevent establishment of invasive species that could compete with the planted native species.

Planting is scheduled for March 2020.

6.3 Riparian Area Enhancement Activities

The revegetation plan for the buffer enhancement areas under 15A NCAC 02B .0295(n) will include planting supplemental bare root trees and controlling invasive species growth. The tree species to be planted are listed in Table 9.

6.4 Riparian Area Preservation Activities

No work is proposed in the buffer preservation areas, as allowed under 15A NCAC 02B .0295(o). The preservation area will be protected in perpetuity under a conservation easement.

7.0 Performance Standards

The performance criteria for the Site will follow approved performance criteria presented in the guidance documents outlined in RFP 16-007702 and the Consolidated Buffer Rule (15A NCAC 02B .0295). Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. The nutrient offset and buffer restoration project will be assigned specific performance criteria components for vegetation. Performance criteria will be evaluated throughout the five-year post-construction monitoring. An outline of the performance criteria components follows.

7.1 Vegetation

The final vegetative success criteria will be the survival of at least 260 stems per acre at the end of the fifth year of monitoring, with a minimum of four native hardwood tree or shrub species composition and no one species comprises more than 50 percent of stems. Vigor, species composition, and density will all be assessed. The extent of invasive species coverage will also be monitored and controlled as necessary throughout the required monitoring period.

Permanent vegetation monitoring plots will be installed and evaluated within the buffer restoration areas to measure the survival of the planted trees. The plots will be randomly placed throughout the planted riparian areas. A total of 13 plots will be established within the riparian buffer restoration and nutrient offset credit generation areas which will make up at least 2% of the planted area (Figure 9). The size of individual quadrants will be 100 square meters.

Vegetation assessments will be conducted and follow the Carolina Vegetation Survey (CVS) Level 2 Protocol for Recording Vegetation (2008) or another DMS approved protocol. A reference photo will be taken from the southwestern corner of each of the 13 plots. Photos will be taken from all photo points each monitoring year and provided in the annual reports. All planted stems will be marked with flagging tape and recorded.

7.2 Reference Photographs

Drone photographs will be taken within the project area once a year to visually document vegetation growth for five years following construction.



7.3 Visual Assessments

Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment). Areas of concern will be mapped and photographed accompanied by a written description in the annual report. Problem areas will be re-evaluated during each subsequent visual assessment. Should remedial actions be required, recommendations will be provided in the annual monitoring report.

7.4 Reporting Performance Criteria

Using the DMS Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template version 2.0 (May 2017), a baseline monitoring document and as-built record drawings of the project will be developed for the constructed Site. Complete monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS. Annual monitoring reports will be based on the above referenced DMS Template (May 2017). The monitoring period will extend five years beyond completion of construction or until performance criteria have been met.

7.5 Maintenance and Contingency Plans

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase will identify an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria (if applicable).

8.0 Monitoring Plan

The Site monitoring plan has been developed to ensure that the required performance standards are met, and project goals and objectives are achieved. The monitoring report shall provide project data chronology that will facilitate an understanding of project status and trends, ease population of DMS databases for analysis and research purposes and assist in close-out decision making.

8.1 Monitoring Components

Project monitoring components are listed in more detail in Table 10 and Figure 9.

Table 10: Monitoring Components

Parameter	Monitoring Feature	Quantity	Frequency
Vegetation	CVS Level 1 and 2	13	Annual
Visual Assessment		Y	Semi-Annual
Exotic and nuisance vegetation		Y	Semi-Annual
Project Boundary		Y	Semi-Annual
Reference Photos	Drone Photographs	Y	Annual



9.0 Long-Term Management Plan

The Site will be transferred to the NCDEQ Stewardship Program. This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the site to ensure that restrictions required in the conservation easement are upheld. The NCDEQ Stewardship Program is developing an endowment system within the non-reverting, interest-bearing Conservation Lands Conservation Fund Account. The use of funds from the Endowment Account will be governed by North Carolina General Statute GS 113A-232(d)(3). Interest gained by the endowment fund may be used for stewardship, monitoring, stewardship administration, and land transaction costs, if applicable.

The Stewardship Program will periodically install additional signage as needed to identify boundary markings. Internal easement crossings planned for the project area will be the responsibility of the landowner to maintain. The Site Protection Instrument can be found in the Appendix.

10.0 Adaptive Management Plan

Upon completion of Site construction, Wildlands will implement the post-construction monitoring defined in Section 8. Project maintenance will be performed during the monitoring years to address minor issues as necessary. If, during annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the members of DMS/NCDWR and work with the DMS/NCDWR to develop contingency plans and remedial actions. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria (if applicable).



11.0 References

Natural Resources Conservation Service (NRCS), 2019. Web Soil Survey of Orange County.
<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.

North Carolina Division of Water Quality (NCDWQ), 2011. Surface Water Classifications.
<http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/classifications>.

North Carolina Geological Survey (NCGS), 1985. Geologic Map of North Carolina: Raleigh, North Carolina Department of Natural Resources and Community Development, Geological Survey Section, scale 1:500,000, in color.

NCGS, 2013. Mineral Resources. <http://deq.nc.gov/about/divisions/energy-mineral-land-resources/north-carolina-geological-survey/mineral-resources>.




North Carolina Natural Heritage Program (NHP), 2018. Natural Heritage Element Occurrence Database, Orange County, NC.

United States Fish and Wildlife Service (USFWS), 2018. Endangered Species, Threatened Species, Federal Species of Concern and Candidate Species, Orange County, NC.
<https://www.fws.gov/raleigh/species/cntylist/orange.html>.



FIGURES

Directions: Traveling east on I-40E/I-85N from Greensboro, keep right at fork to continue on I-40E (follow signs for I-40/Raleigh) (2.4 miles). Take exit 261 (towards Hillsboro) (0.3 miles). Turn right onto Old NC 86 (2.7 miles). Turn right onto Arthur Minnis Rd. (2.3 miles). The site will be on the right.

-  Project Location
-  Conservation Easement Boundary
-  Mangum Homestead Mitigation Site Location

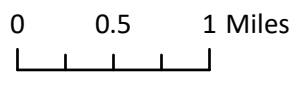
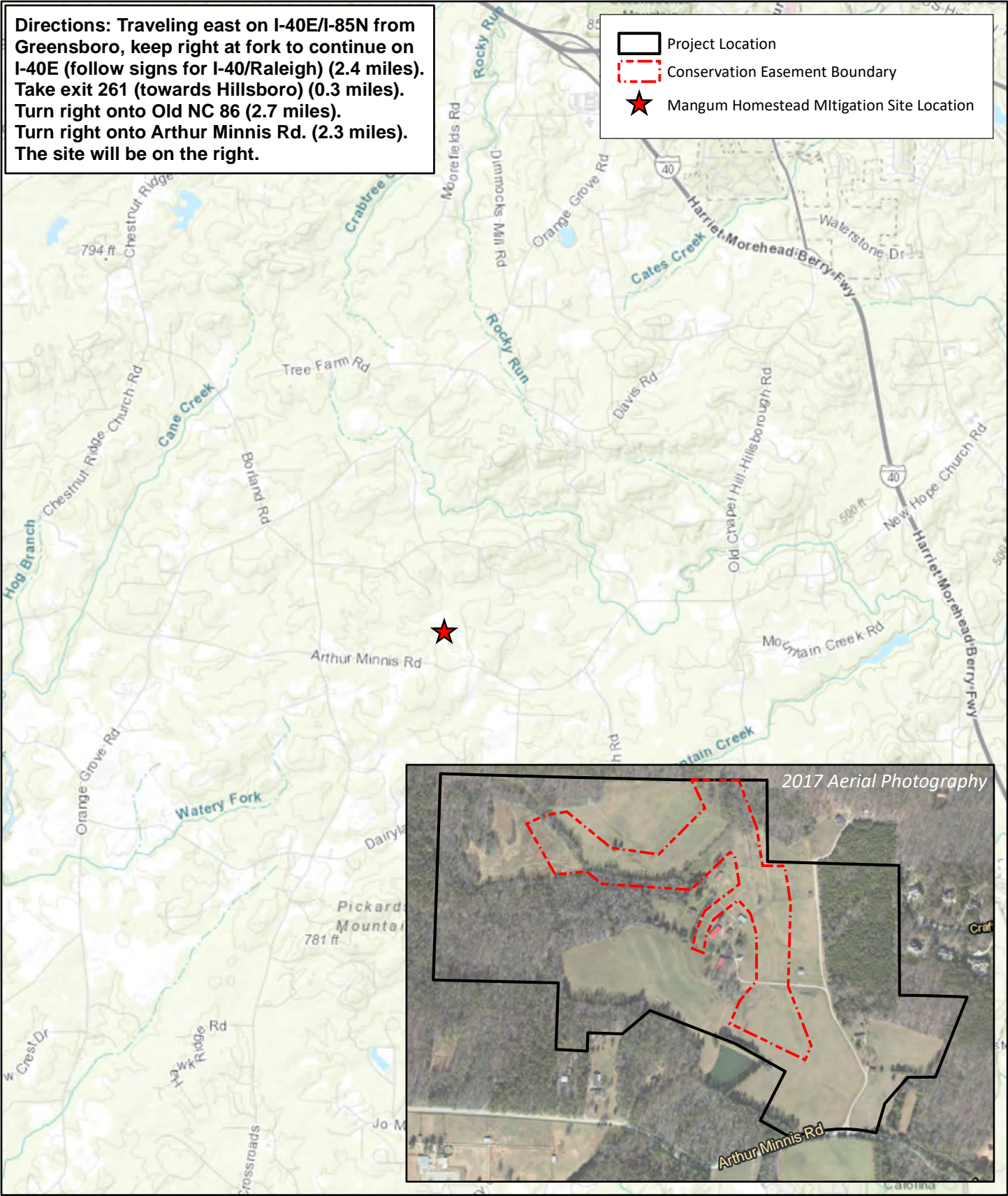


Figure 1 Vicinity Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

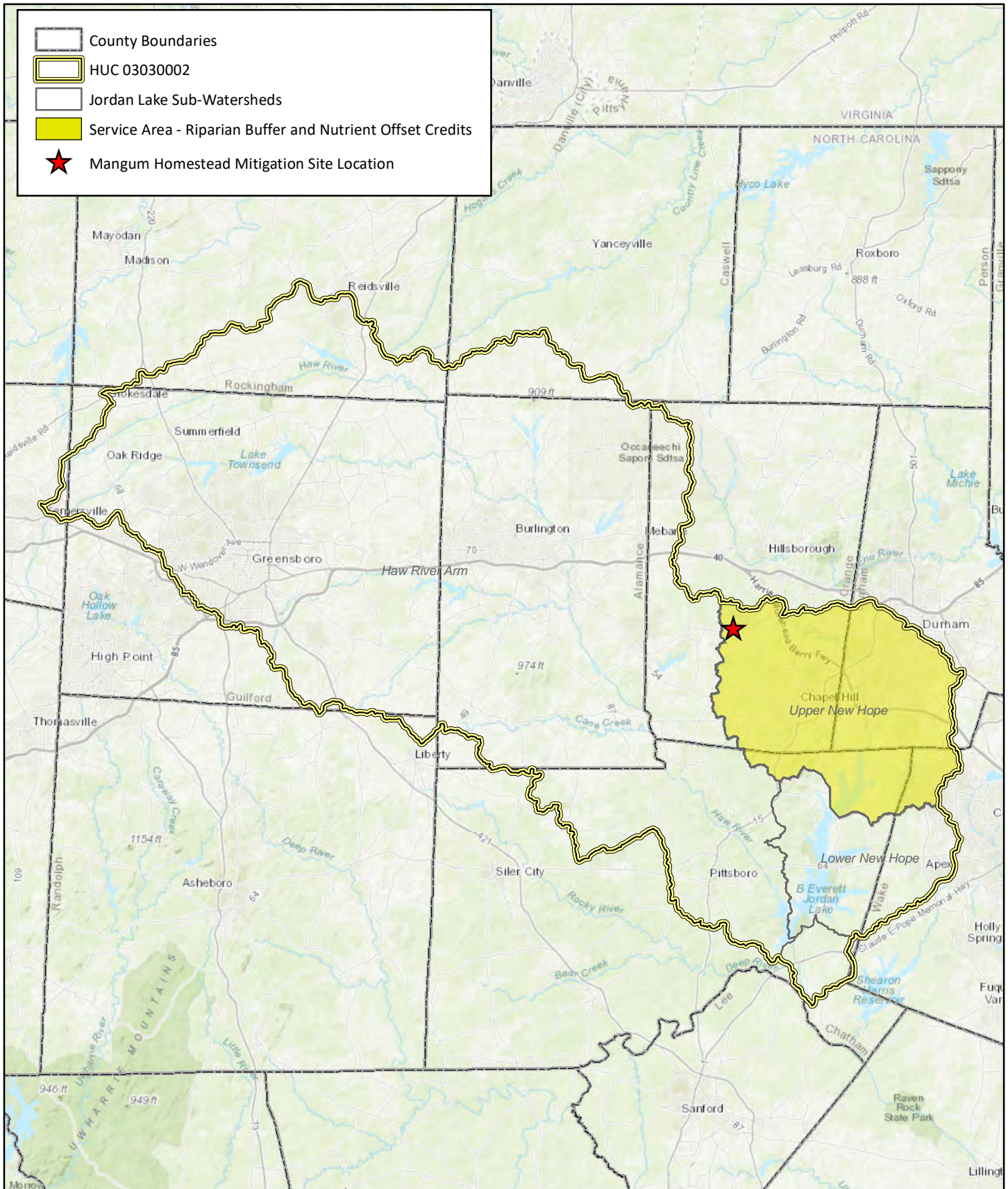
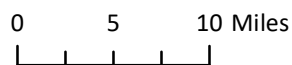


Figure 2 Service Area Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC



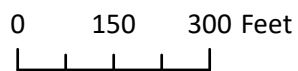
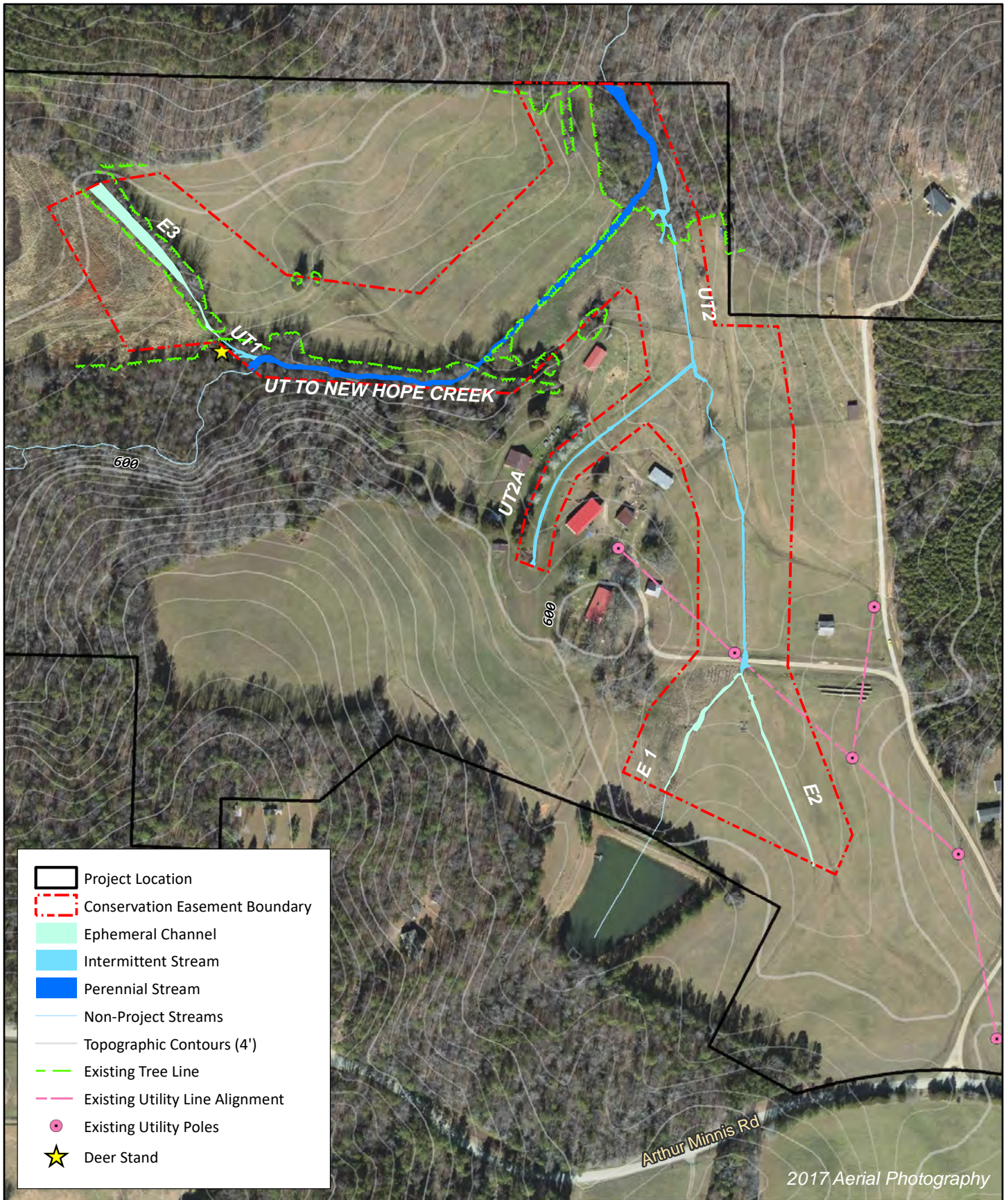


Figure 3 Site Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

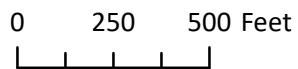
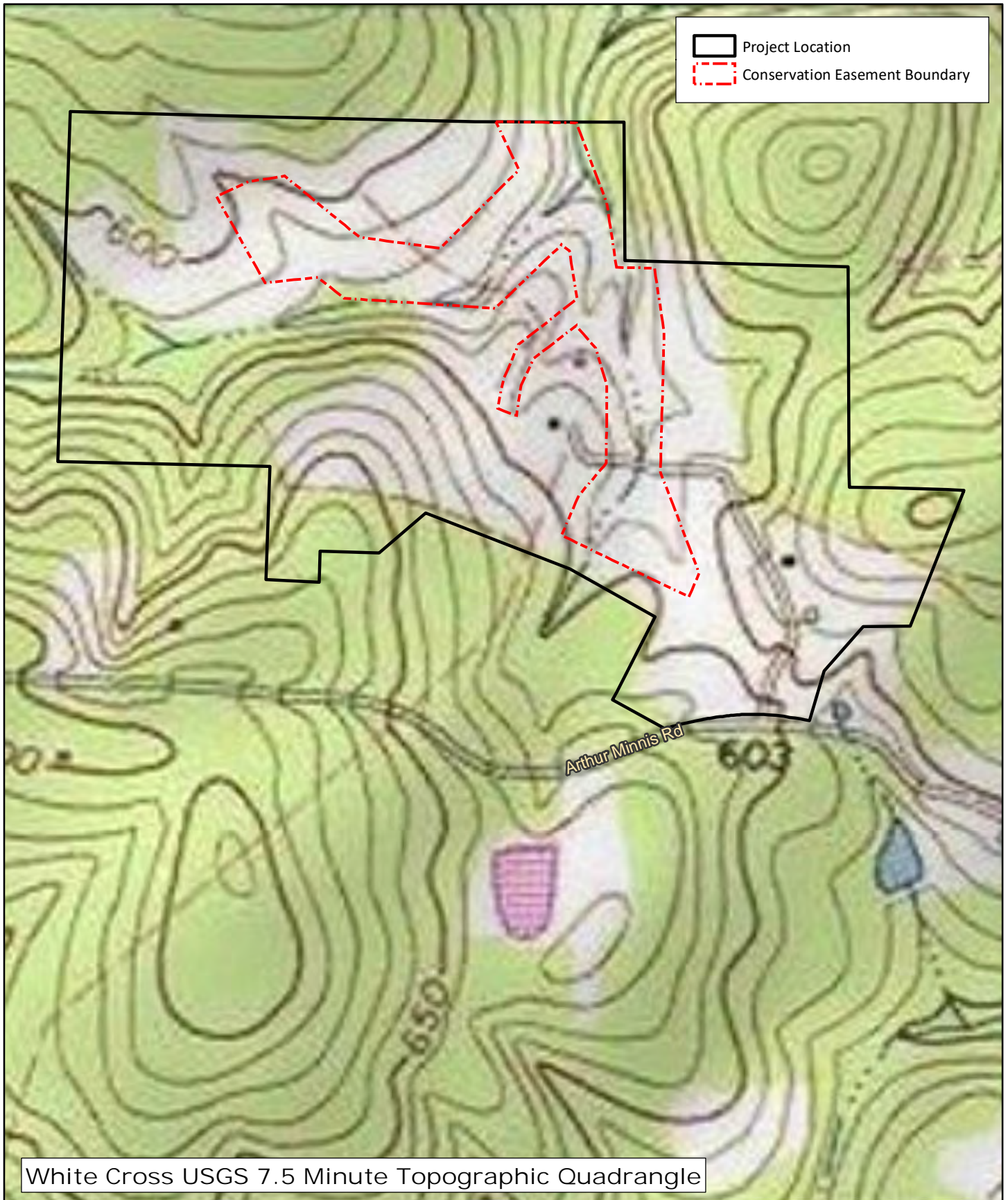


Figure 4 USGS Topographic Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

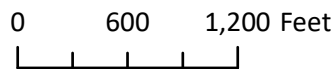
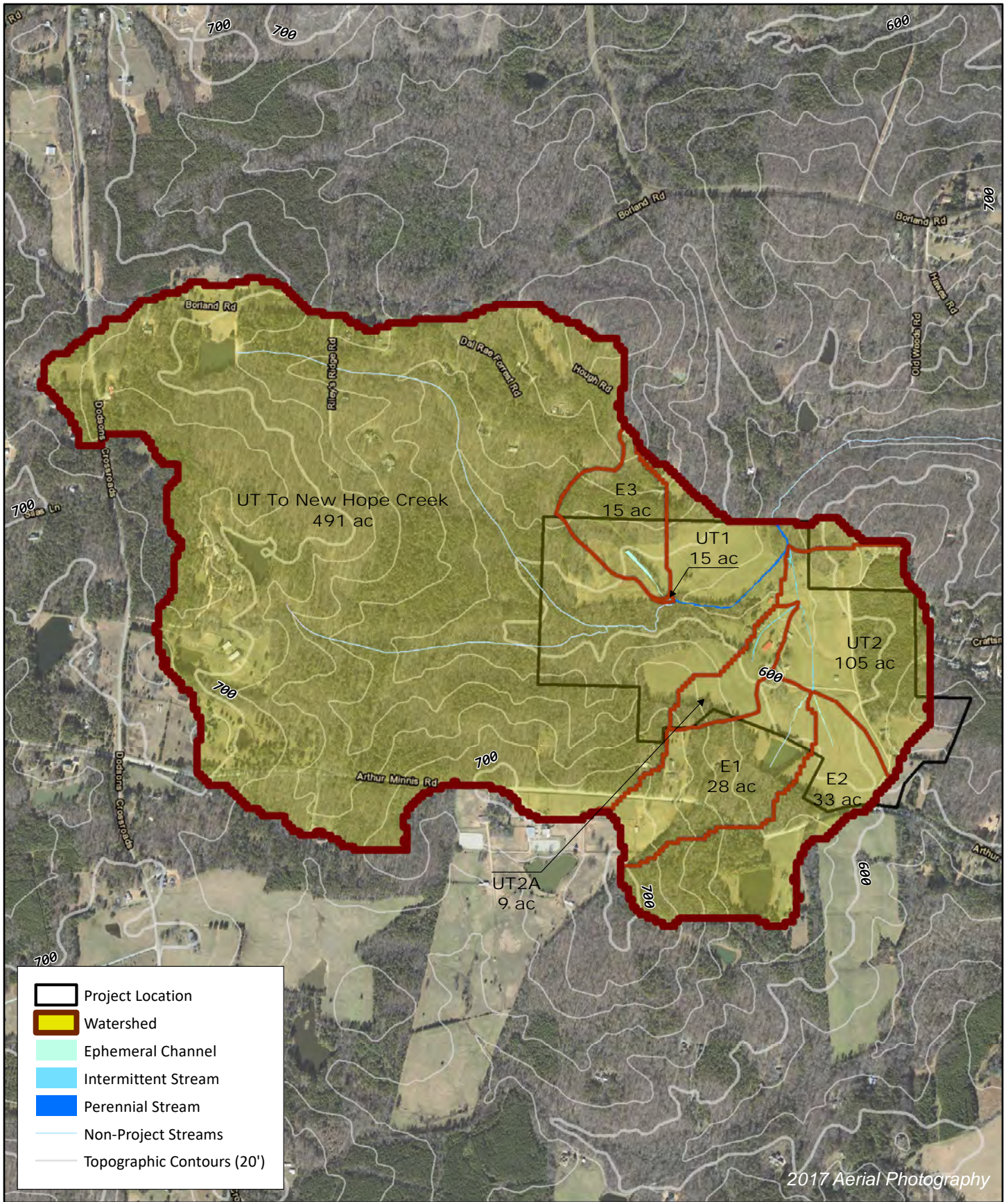


Figure 5 Watershed Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

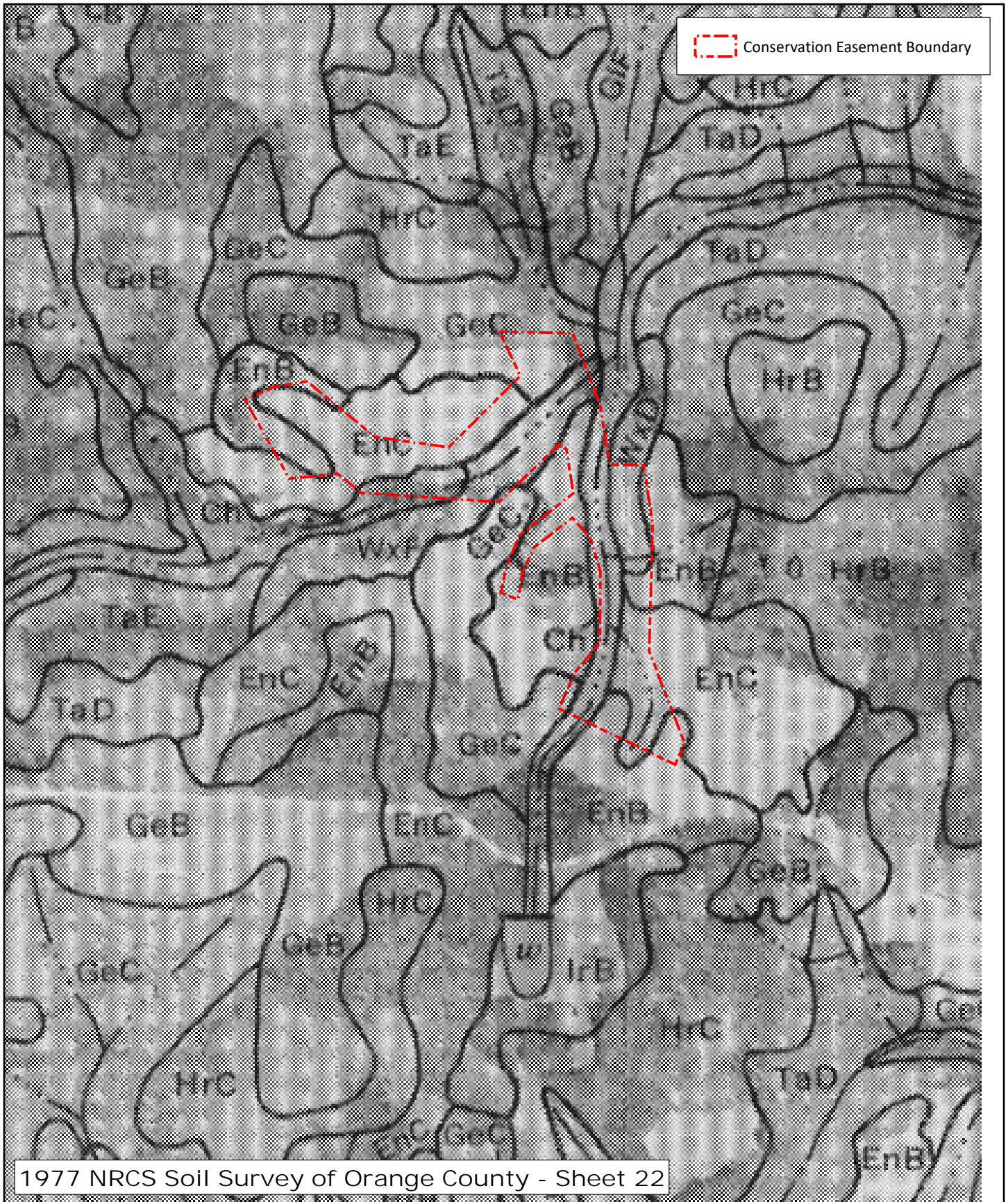


Figure 6 1977 NRCS Soil Survey Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (0303002)
 Orange County, NC



0 275 550 Feet



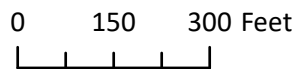
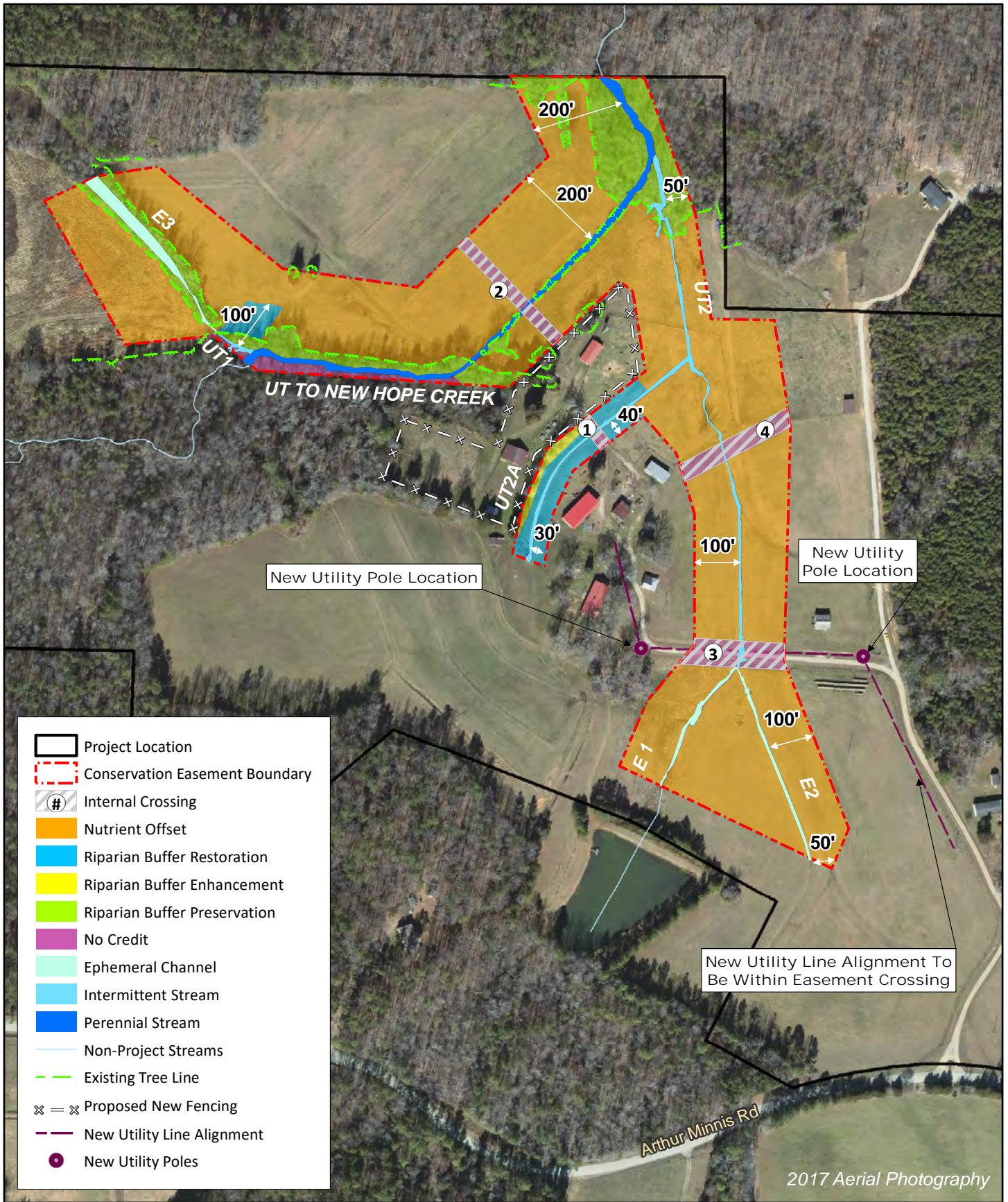


Figure 7 Concept Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

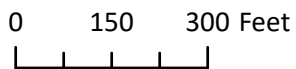
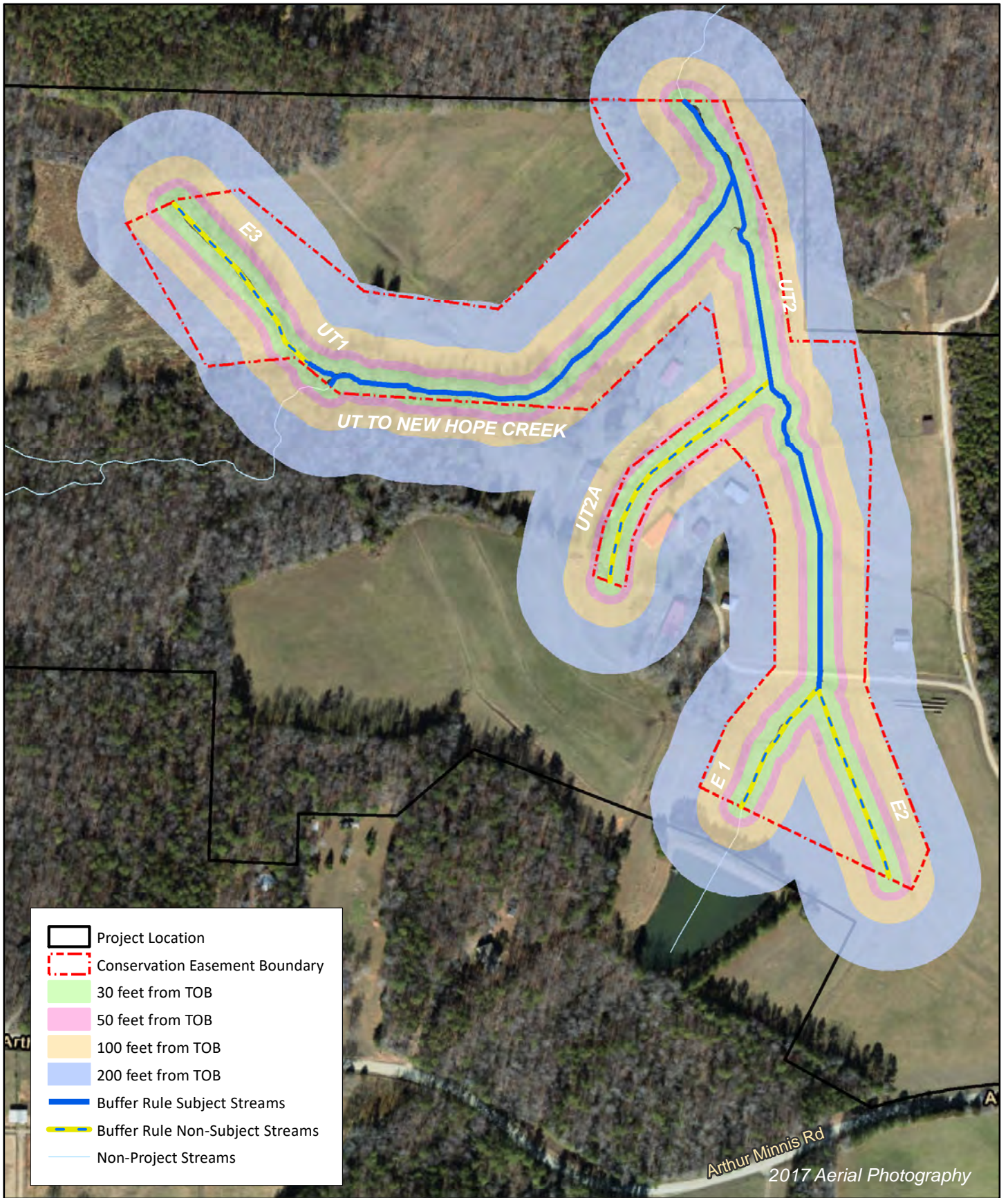


Figure 8 Riparian Buffer Zones Map
Mangum Homestead Mitigation Site
Mitigation Plan
Cape Fear River Basin (03030002)
Orange County, NC

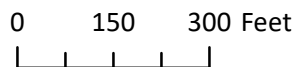
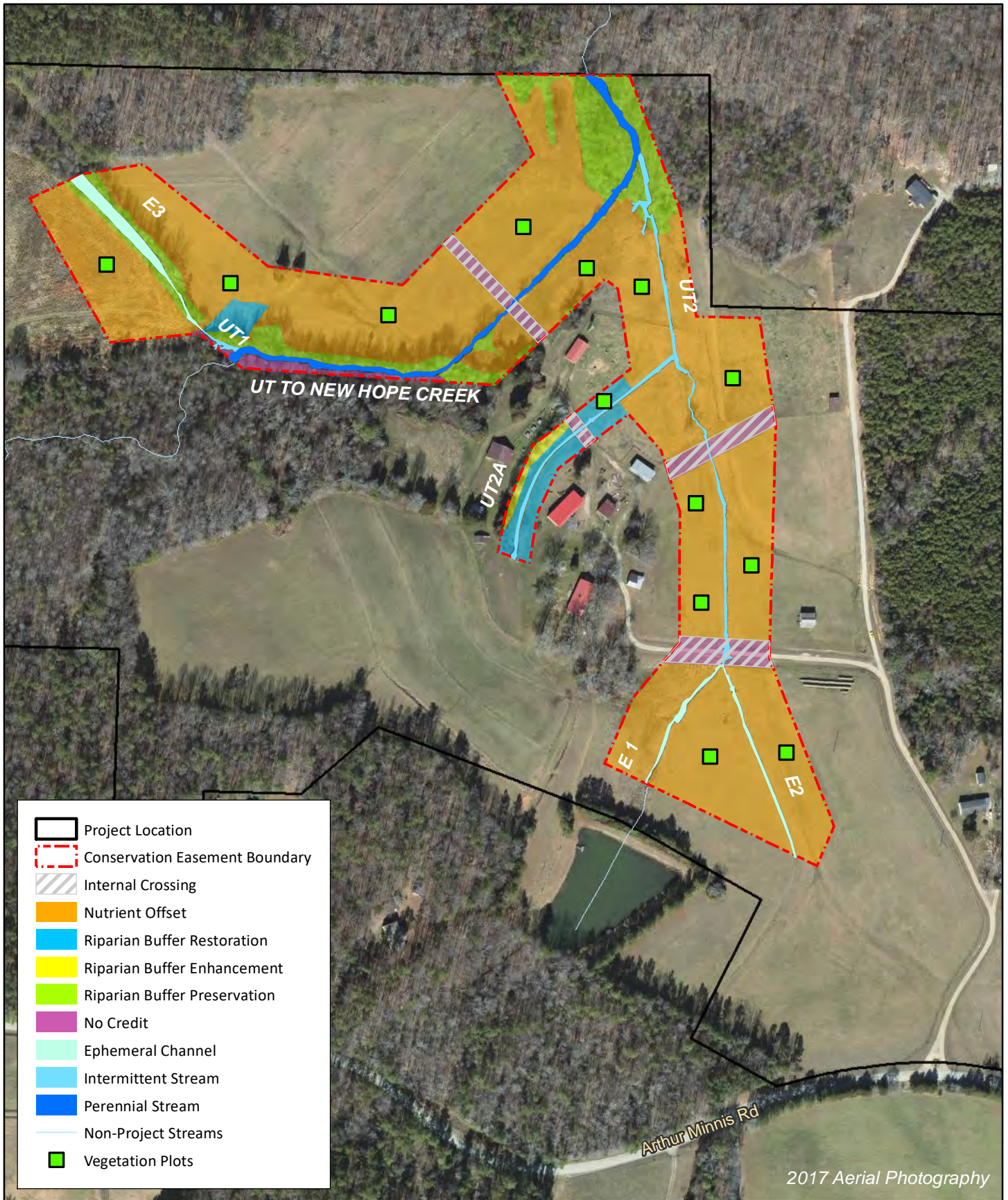


Figure 9 Monitoring Map
 Mangum Homestead Mitigation Site
 Mitigation Plan
 Cape Fear River Basin (03030002)
 Orange County, NC

APPENDIX



Mangum Homestead

1449 Foggy Bottom Lane

Hillsborough, NC 27278

Inquiry Number: 5508907.5

December 12, 2018

The EDR Aerial Photo Decade Package



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Site Name:

Mangum Homestead
 1449 Foggy Bottom Lane
 Hillsborough, NC 27278
 EDR Inquiry # 5508907.5

Client Name:

Wildlands Eng, Inc.
 1430 South Mint Street
 Charlotte, NC 28203
 Contact: Andrea Eckardt



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.

Search Results:

<u>Year</u>	<u>Scale</u>	<u>Details</u>	<u>Source</u>
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1999	1"=750'	Flight Date: February 15, 1999	USGS
1993	1"=500'	Acquisition Date: March 01, 1993	USGS/DOQQ
1982	1"=500'	Flight Date: April 23, 1982	NHAP
1980	1"=1000'	Flight Date: January 19, 1980	USGS
1975	1"=500'	Flight Date: November 16, 1975	USDA
1973	1"=500'	Flight Date: February 24, 1973	USGS
1964	1"=500'	Flight Date: March 12, 1964	USGS
1961	1"=500'	Flight Date: August 17, 1961	USGS
1955	1"=500'	Flight Date: March 29, 1955	USDA
1950	1"=500'	Flight Date: November 18, 1950	USGS
1938	1"=500'	Flight Date: June 15, 1938	USDA

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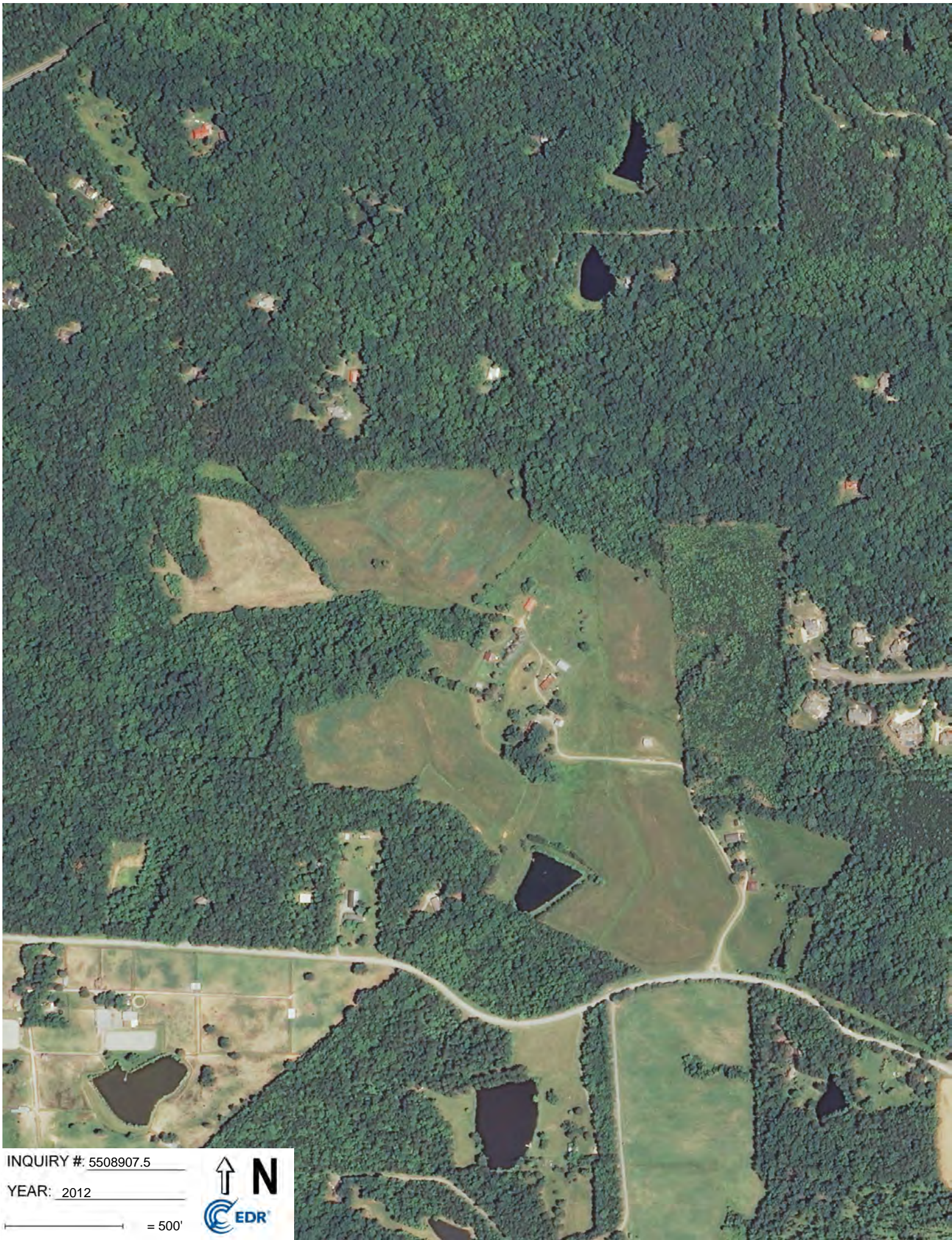


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YEAR: 2016

— = 500'





INQUIRY #: 5508907.5

YEAR: 2012

— = 500'





INQUIRY # 5508907.5

YEAR: 2009

— = 500'





INQUIRY #: 5508907.5

YEAR: 2006

— = 500'





INQUIRY #: 5508907.5

YEAR: 1999

— = 750'





INQUIRY #: 5508907.5

YEAR: 1993

— = 500'



Subject boundary not shown because it exceeds image extent or image is not georeferenced.



INQUIRY #: 5508907.5

YEAR: 1982

— = 500'



1-19-80

INQUIRY #: 5508907.5

YEAR: 1980

— = 1000'





INQUIRY #: 5508907.5

YEAR: 1975

— = 500'





INQUIRY #: 5508907.5

YEAR: 1973

— = 500'



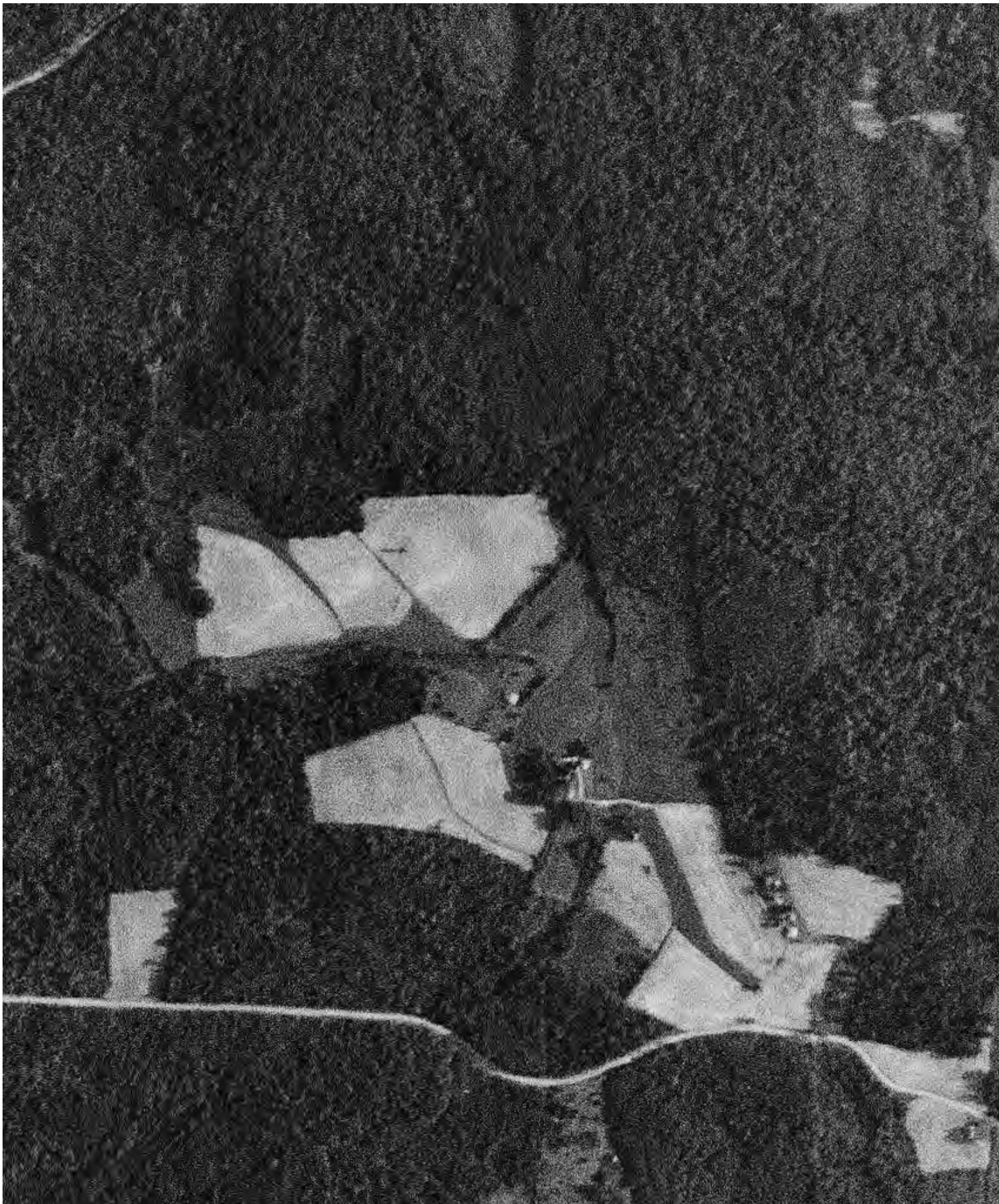


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YEAR: 1964

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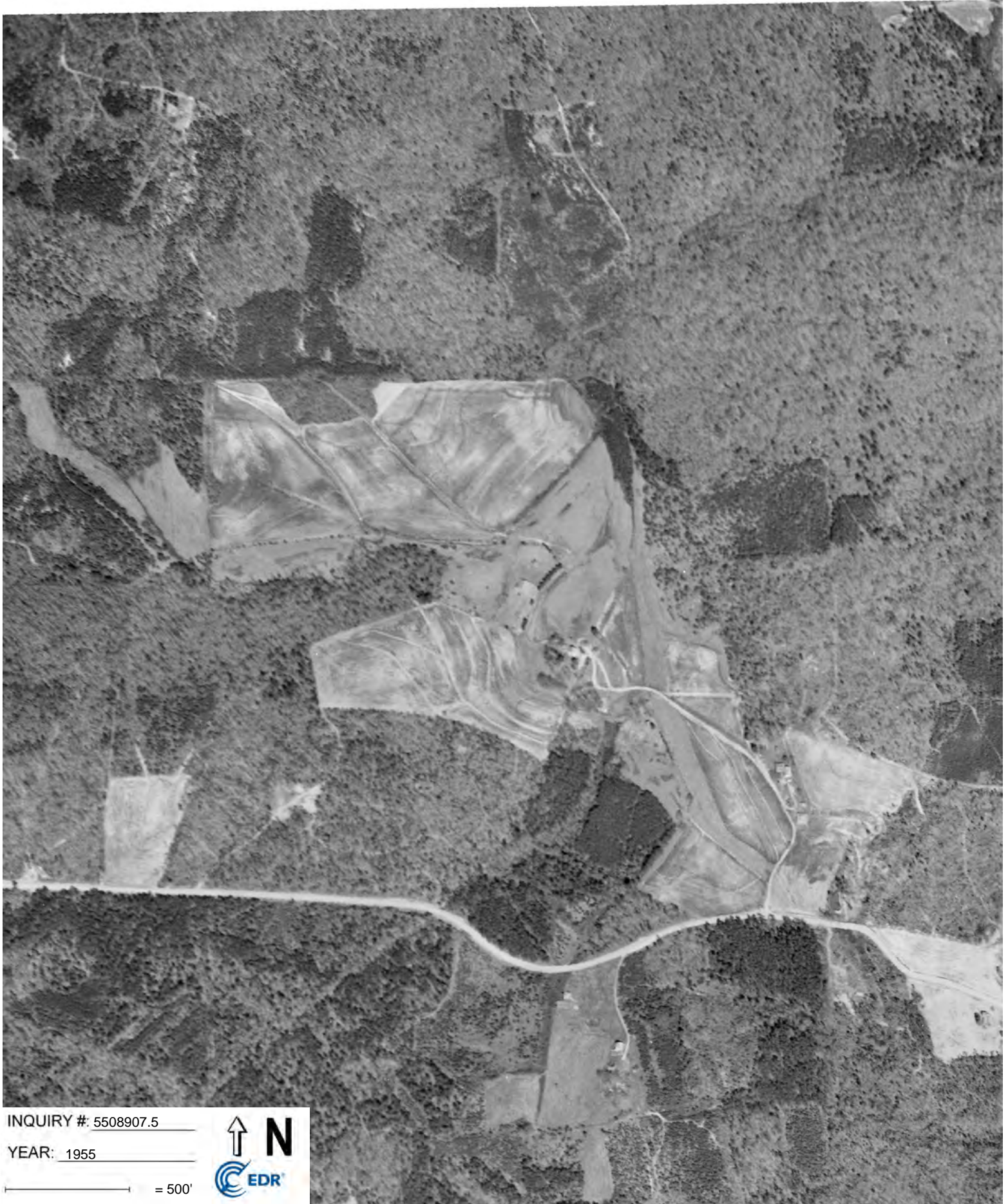


INQUIRY # 5508907.5

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INQUIRY #: 5508907.5

YEAR: 1955

— = 500'





INQUIRY #: 5508907.5

YEAR: 1950

— = 500'





INQUIRY #: 5508907.5

YEAR: 1938

— = 500'





Photo 1 – UT New Hope Creek and UT1 left bank



Photo 2 – UT1 left bank



Photo 3 – UT2 downstream



Photo 4 – UT2A upstream



Photo 5 – UT2A downstream



Photo 6 – E3 Right Bank





Photo 7 – E1 and E2 upstream



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

LINDA CULPEPPER
Director



NORTH CAROLINA
Environmental Quality

September 4, 2019

Andrea Eckardt
Wildlands Engineering, Inc
1430 S. Mint St, Suite 104
Charlotte, NC 28203
(via electronic mail: aekardt@wildlandseng.com)

DWR# 2019-0645
Orange County

Re: Site Viability for Buffer Mitigation & Nutrient Offset – Mangum Homestead Site
Located at 1449 Foggy Bottom Ln, Hillsborough, NC
Upper New Hope of Jordan Lake Watershed

Dear Ms. Eckardt,

On May 14, 2019, Katie Merritt, with the Division of Water Resources (DWR), received a request from Wildlands Engineering, Inc. (Wildlands) for an onsite mitigation determination near the above-referenced site (Site). The Site is located within the Upper New Hope sub-watershed of Jordan Lake in the Cape Fear River Basin. The Site is being proposed as part of a full-delivery riparian buffer mitigation and nutrient offset project for the Division of Mitigation Services (RFP #16-007702). On July 19, 2019, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to streams and channels onsite, which are shown on the attached map labeled "Site Map". Staff from the Division of Mitigation Services were also present onsite.

Ms. Merritt's evaluation of the features onsite and their associated mitigation determination for the riparian areas are provided in the table below. This evaluation was made from Top of Bank (TOB) and landward 200' from each feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0240.



North Carolina Department of Environmental Quality | Division of Water Resources
512 North Salisbury Street | 1617 Mall Service Center | Raleigh, North Carolina 27699-1617
919.707.9000

<u>Feature</u>	<u>Classification onsite</u>	<u>¹Subject to Buffer Rule</u>	<u>Riparian Land uses adjacent to Feature (0-200')</u>	<u>Buffer Credit Viable</u>	<u>²Nutrient Offset Viable</u>	<u>⁵Mitigation Type Determination w/in riparian areas</u>
E1	Ephemeral	No	Non-forested hay field	⁴ Yes	Yes	Restoration Site per 15A NCAC 02B .0295 (o)(7)
E2	Ephemeral	No	Non-forested hay field	⁴ Yes	Yes	Restoration Site per 15A NCAC 02B .0295 (o)(7)
UT2	Stream	Yes	Mostly non-forested hay field with some forested areas downstream	³ Yes	Yes (<i>non-forested areas only</i>)	Non-forested areas - Restoration Site per 15A NCAC 02B .0295 (n) Forested Areas - Preservation Site per 15A NCAC 02B .0295 (o)(5)
UT2A	Stream	No	Mostly non-forested grassed lawn with some trees along fence line	Yes	No	Restoration Site per 15A NCAC 02B .0295 (o)(3) Tree line - Enhancement Site per 15A NCAC 02B .0295 (o)(3)
E3	Ephemeral	No	Combination of forested areas mostly along the channel and non-forested hay fields	^{3,4} Yes	Yes (<i>non-forested areas only</i>)	Non-forested areas - Restoration Site per 15A NCAC 02B .0295 (o)(7) Forested Areas - Preservation Site per 15A NCAC 02B .0295 (o)(7)
UT1 (at DWR flag)	Stream	Yes	Combination of forested areas mostly along the channel and non-forested hay fields	³ Yes	Yes (<i>non-forested areas only</i>)	Non-forested areas - Restoration Site per 15A NCAC 02B .0295 (n) Forested Areas - Preservation Site per 15A NCAC 02B .0295 (o)(5)
UT to New Hope Creek	Stream	Yes	Combination of forested areas mostly along the channel and non-forested hay fields	³ Yes	Yes (<i>non-forested areas only</i>)	Non-forested areas - Restoration Site per 15A NCAC 02B .0295 (n) Forested Areas - Preservation Site per 15A NCAC 02B .0295 (o)(5)

¹Subjectivity calls for the features were determined by DWR in correspondence dated August 27, 2019 using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS .

² NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment. Nitrogen and Phosphorus are calculated differently in the Jordan Lake Watershed.

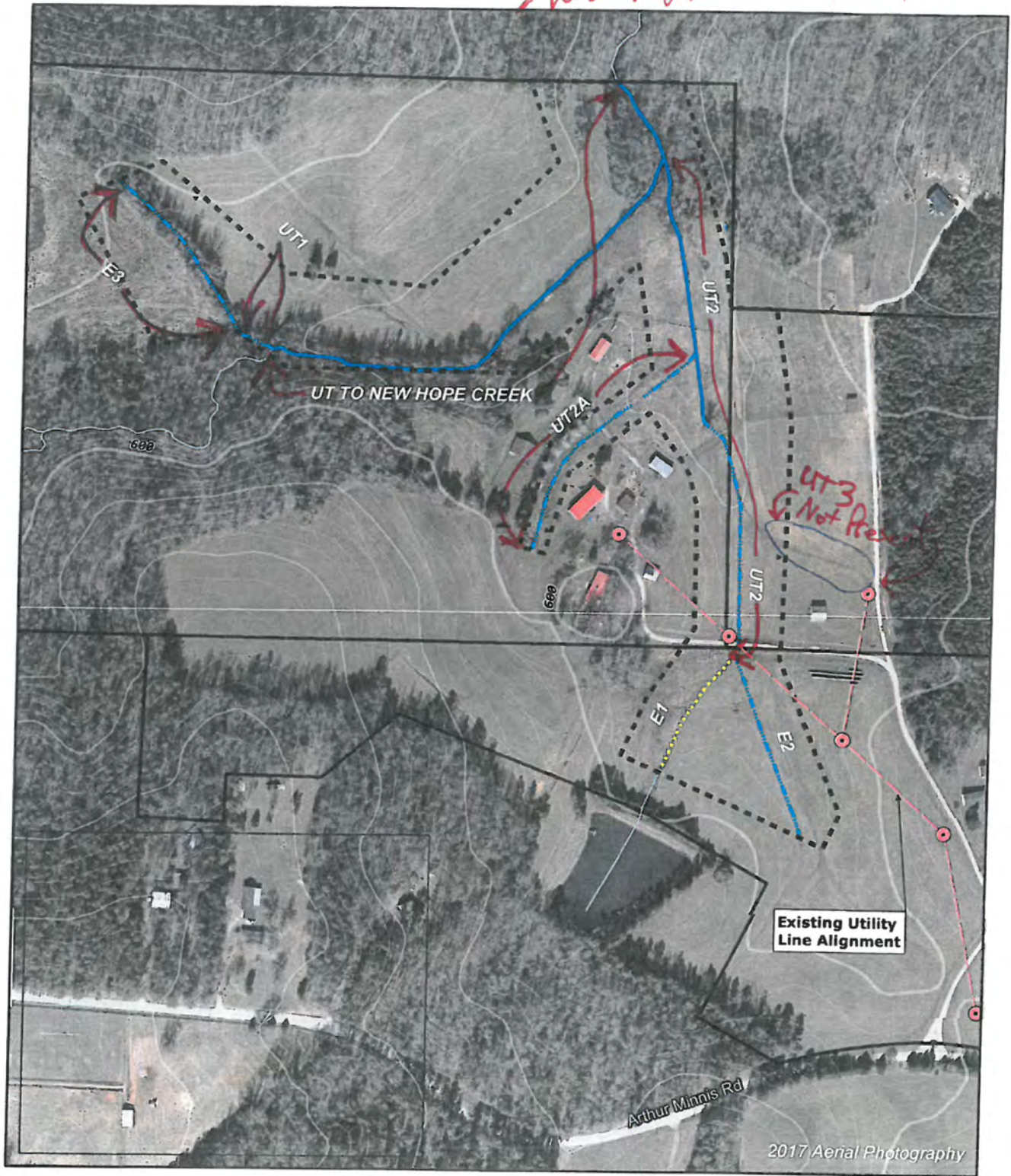
³The area of preservation credit within a buffer mitigation site shall comprise of no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 0295 (o)(5) and 15A NCAC 0295 (o)(4). Site cannot be a Preservation Only site to comply with this rule.

⁴The area of the mitigation site on ephemeral channels shall comprise no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 02B .0295 (o)(7).

⁵All features proposed for buffer mitigation or nutrient offset, must have a conservation easement established that includes the tops of channel banks when being measured perpendicular and landward from the channel, even when no credit is viable within the 50' riparian area.

The site map attached to this letter was prepared by Wildlands and edited by DWR to match this correspondence. This letter does not constitute an approval of this site to generate mitigation credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0240, a proposal regarding a

Shubert 8/26/19



0 150 300 Feet

Handwritten signature and date: 9/4/19

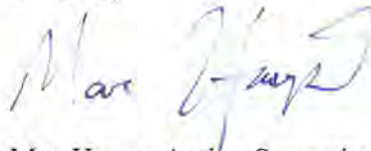
Site Map
Mangum Homestead Mitigation Site
Cape Fear River Basin (03030002)
Orange County, NC

proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0240.

This viability assessment will expire on September 4, 2021 or upon the submittal of an As-Built Report to the DWR, whichever comes first. **This letter should be provided in all stream and wetland, buffer and/or nutrient offset mitigation plans for this Site.**

Sincerely,



Mac Haupt, Acting Supervisor
401 and Buffer Permitting Branch

MH/km

Attachments: Site Map

cc: File Copy (Katie Merritt)
Lindsay Crocker- DMS (via electronic mail)

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director



August 27, 2019

DWR Project # 2019-0645 V2
Orange County

Andrea Eckardt
Wildlands Engineering Inc.
1430 S. Mint Street, Suite 104
Charlotte, NC 28203

Subject: On-Site Determination for Applicability to the Jordan Buffer Rules (15A NCAC 02B .0267)

Project Name: Mangum Homestead Mitigation Site

Parcel ID Numbers: 9851671991, 9851778621, 9851763367

Address/ Location: 1449 Foggy Bottom Lane, Hillsborough, Orange County, NC

Stream(s) Evaluated: Unnamed Tributaries to New Hope Creek, Classified as WS-V; NSW

Determination Date: 7/19/2019

Staff: DWR, Shelton Sullivan

Dear Andrea,

On July 19, 2019, Shelton Sullivan of the Division of Water Resources (DWR) Central Office conducted an on-site review of features located on the subject property at the request of Wildlands Engineering Inc. The purpose of the review was to determine the applicability to the Jordan Riparian Area Protection Rules (15A NCAC 02B .0267) and perform stream determinations within the proposed project easement.

The enclosed site map indicates the features evaluated and this information is also summarized in the table below. Streams that are "Subject" are shown on the most recently published NRCS Soil Survey of Orange County and/or the most recent copy of the USGS Topographic (at 1:24,000 scale) maps, have been located on the ground at the site, and possess characteristics that qualify them to be at least intermittent streams. Features that are "Not Subject" are not depicted on the required maps, not present on the property, or have been determined to not be at least intermittent.

Please note that there may be other surface waters located on the property that may be subject to the Jordan Riparian Area Protection Rules, considered jurisdictional according to the US Army Corps of Engineers, and subject to the Clean Water Act.



North Carolina Department of Environmental Quality | Division of Water Resources
512 North Salisbury Street | 1617 Mail Service Center | Raleigh, North Carolina 27699-1617
919.707.9000

See the following table for the features rated during the DWR site visit:

Feature ID	*E/I/P/ Other	Subject to Buffer Rules	Start @	Stop @	Depicted on Soil Survey	Depicted on USGS Topo
E3	"E"	No	Northwest project easement	Downstream of the pipe at flag and UT1 Start	Yes	No
UT1	"I"	Yes	Downstream of the pipe at flag and UT1 Start	Confluence of UT1 and UT to New Hope Creek	Yes	No
UT to New Hope Creek	"P"	Yes	Project easement	Continues throughout	Yes	Yes
E1	"E"	No	Southern project easement below pond.	Continues downstream to confluence with E2	Yes	Yes
E2	"E"	No	Southern project easement.	Continues downstream to confluence with E1	Yes	No
UT2	"I"	Yes	Confluence of E1 and E2, just upstream of culvert	Continues downstream to confluence of UT to New Hope Creek	Yes	Yes
**UT2A	"I"	No	Project easement.	Continues downstream to confluence with UT2	No	No
UT3	Not Present	No	Shown on aerials on east side of project easement	N/A	Yes	No

*Ephemeral, I: Intermittent, P: Perennial

**Please note that UT2A has an installed corrugated pipe that is impeding the stream flow to the downstream portion UT2A.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of the date of this letter to the Director in writing.


If sending via U.S. Postal Service:
DWR 401 & Buffer Permitting Branch
Supervisor
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.)
DWR 401 & Buffer Permitting Branch
Supervisor
512 N Salisbury St.
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested **within sixty (60) calendar days**.

This letter only addresses the features on the subject property and within the proposed project easement and does not approve any activity within buffers or within waters of the state. If you have any additional questions or require additional information, please call Shelton Sullivan at (919) 707-3636. This determination is subject to review as provided in Articles 3 & 4 of G.S. 150B.

Sincerely,



Paul Wojcik

for
Mac Haupt, Acting Supervisor
401 & Buffer Permitting Branch

Enclosures: Photographs, Site Map, Soil Survey, USGS Topographical Map

cc: Andrea Eckardt, Wildlands Engineering Inc. via email
Robert and Janie Mangum, 1449 Foggy Bottom Lane, Hillsborough, NC 27278
401 & Buffer Permitting Branch files



Pic 1. E3 Ephemeral



Pic. 2 UT1 Intermittent Start



Pic 3. Confluence of UT1 and UT to New Hope Creek

Photographs 7-19-2019 (continued)



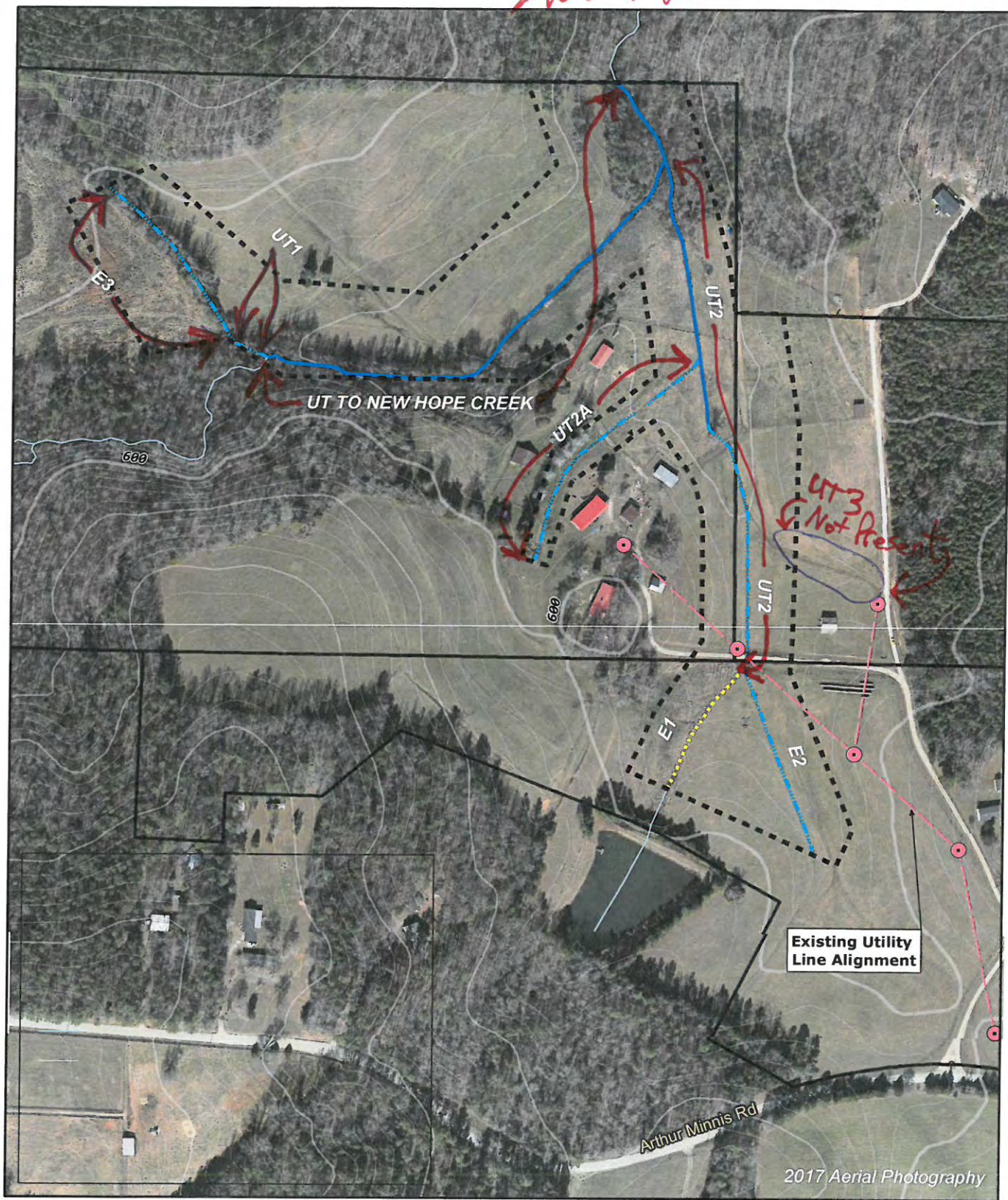
UT2A looking upstream from path



UT2A looking downstream from path

No photographs of UT2 or UT3

Shelbyville 8/26/19



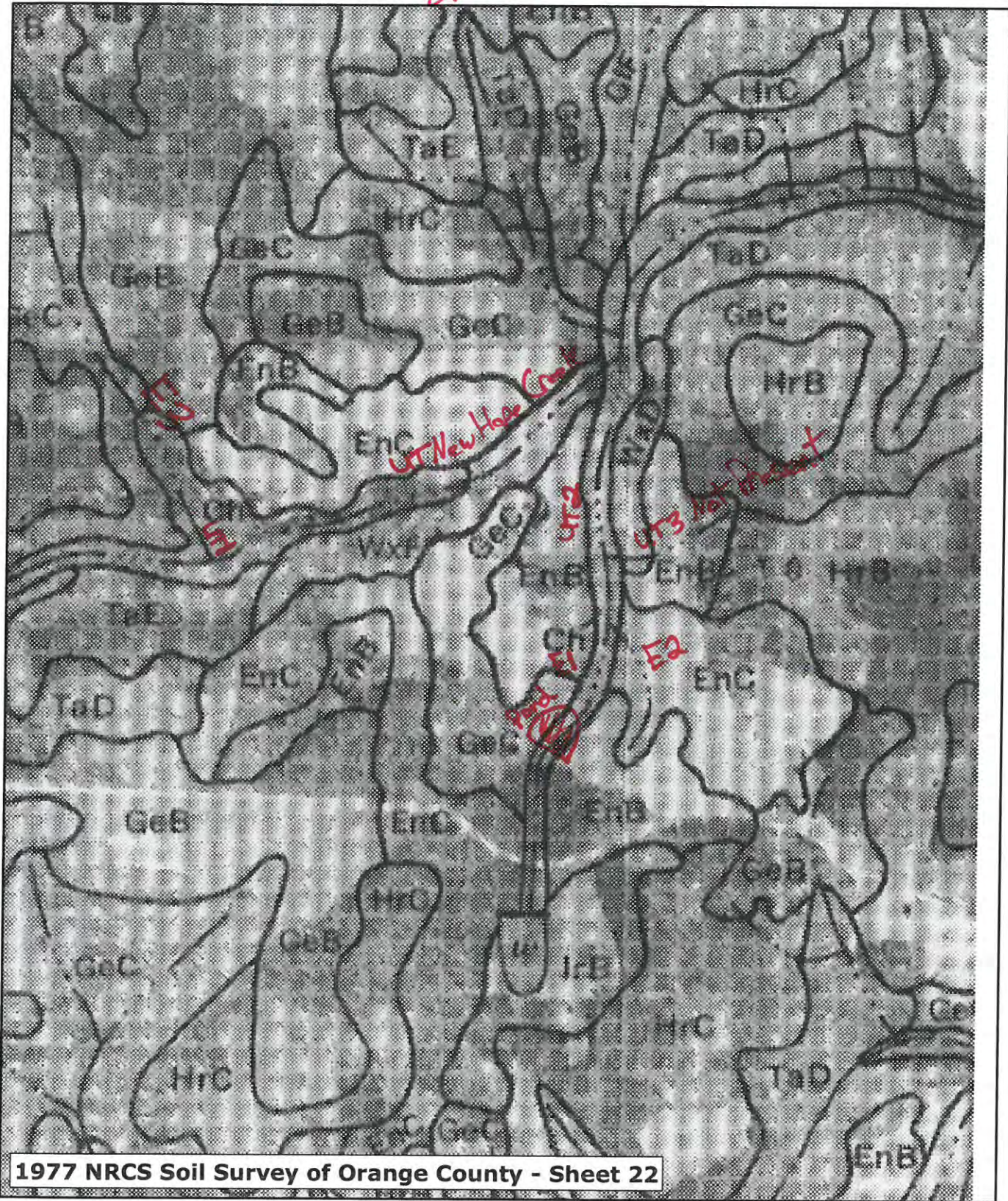
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Site Map
Mangum Homestead Mitigation Site
Cape Fear River Basin (03030002)

Orange County, NC

Submittal 8/26/19



0 275 550 Feet

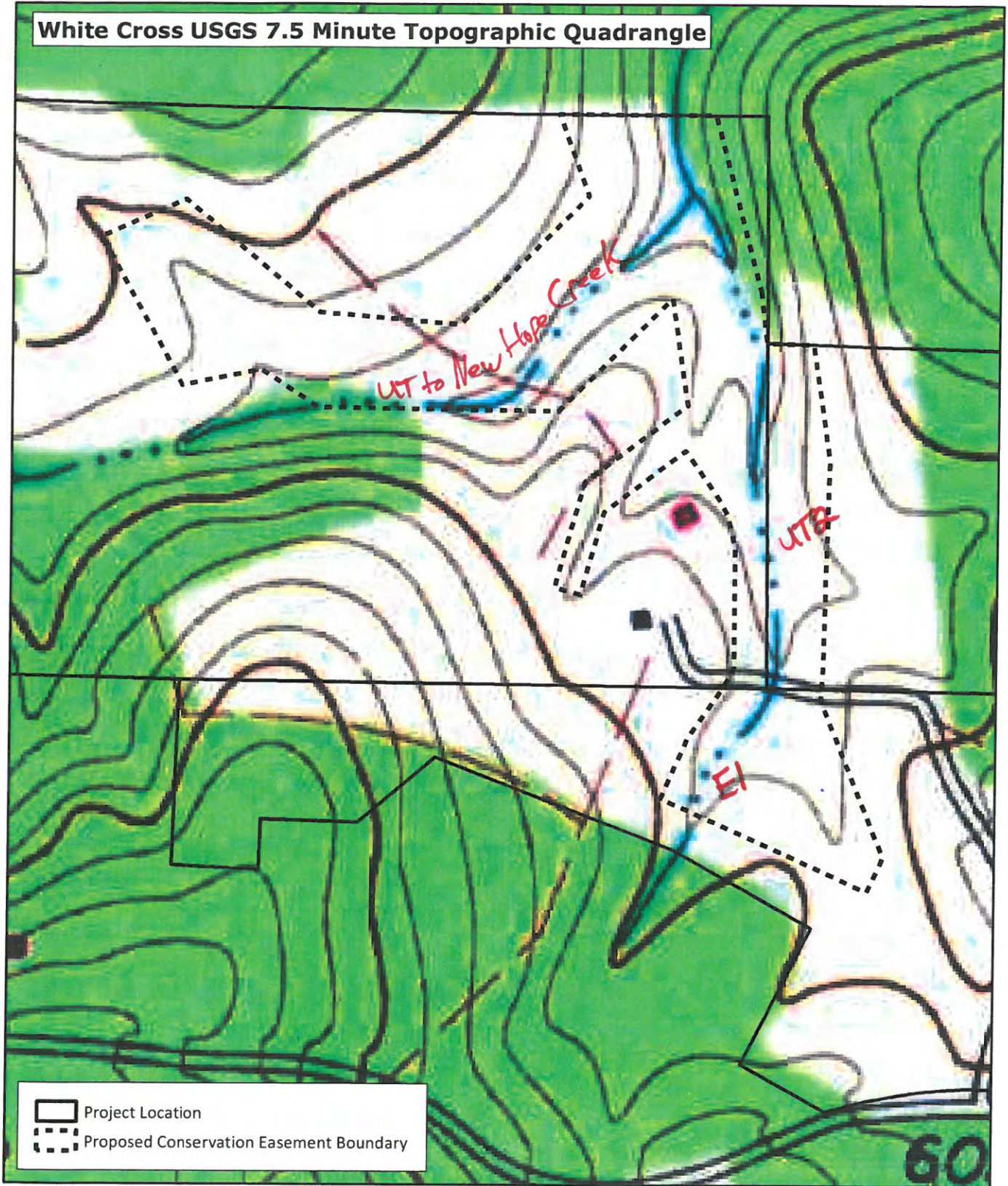


1977 NRCS Soil Survey Map
Mangum Homestead Mitigation Site
Cape Fear River Basin (03030002)

Orange County, NC

Shelby Miller 8/26/19

White Cross USGS 7.5 Minute Topographic Quadrangle



0 150 300 Feet



USGS Topographic Map
Mangum Homestead Mitigation Site
Cape Fear River Basin (03030002)

Orange County, NC

STATE OF NORTH CAROLINA

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

ORANGE COUNTY

**SPO File Numbers: XX-XX
DMS Project Number: 100048**

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 _____, 2019, by **Janie B. and Robert W. Mangum**, (“Grantor”), whose mailing address is **1449 Foggy Bottom Lane, Hillsborough, NC 27278** to the State of North Carolina, (“Grantee”), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

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

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between **Wildlands Engineering, Inc.** and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number **7859**.

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 Division of Mitigation Services (formerly 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' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

WHEREAS, the Division of Mitigation Services in the Department of Environmental Quality (formerly 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 properties situated, lying, and being in _____ Township, Orange County, North Carolina (the "**Property**"), and being more particularly described as that certain parcels of land containing approximately **108.79** acres and being conveyed to the Grantor by deed as recorded in **Deed Book 242, Pages 1870, Deed Book 3746, Page 106, and Deed Book 362, Page 92** of the Orange 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 unnamed tributaries to New Hope Creek.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement and Right of Access together with an access easement to and from the Conservation Easement Area described below.

The Conservation Easement Area consists of the following:

Easement Areas _____ containing a total of _____ acres as shown on the plats of survey entitled "Conservation Easement Survey for the State of North Carolina NCDEQ: Division of Mitigation Services, Mangum Homestead Mitigation Site, SPO File No. _____, DMS Site ID No. 100107, Property of Janie B. and Robert W. Mangum, dated _____ Elisabeth G. Turner (License # L-4440) and recorded in the Orange 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. ACCESS EASEMENT

Grantor hereby grants and conveys unto Grantee, its employees, agents, successors and assigns, a perpetual, non-exclusive easement for ingress and egress over and upon the Property at all reasonable times and at such location as practically necessary to access the Conservation Easement Area for the purposes set forth herein ("Access Easement"). This grant of easement shall not vest any rights in the public and shall not be construed as a public dedication of the Access Easement. Grantor covenants, represents and warrants that it is the sole owner of and is seized of the Property in fee simple and has the right to grant and convey this Access Easement.

III. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

- A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.
- B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.
- C. Educational Uses.** The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.
- D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

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 new roads, trails, walkways, or paving in the Conservation Easement except within a Crossing Area as shown on the recorded survey plat. All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

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

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

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

P. Crossing Areas. “Grantor reserves the right to the Internal Crossing Areas as shown on the “Conservation Easement Survey for the State of North Carolina NCDEQ: Division of Mitigation Services, Mangum Homestead Mitigation Site, SPO File No. _____, DMS Site ID No. 100107, Property of Janie B. and Robert W. Mangum, dated _____ Elisabeth G. Turner (License # L-4440) and recorded in the Orange County, North Carolina Register of Deeds at Plat Book _____, Page _____ for the following purposes:

- Motorized vehicle crossing;
- Utility crossings to include overhead and buried electrical, water lines and sewer lines;
- Cattle crossing so long as fencing across a culvert in the Crossing Area prevents cattle access to the stream, or a ford crossing is kept gated and cattle are only present in the stream only under supervision while rotating cattle between pastures; and/or
- Installation, maintenance, or replacement of a culvert or ford crossing.

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 Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

IV. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees, agents, successors and assigns, shall have a perpetual Right of Access over and upon the Conservation Easement Area to undertake or engage in any activities necessary to construct, maintain, manage, enhance, repair, restore, protect, monitor and inspect the stream, wetland and any other riparian resources in the Conservation Easement Area for the purposes set forth herein or any long-term management plan for the Conservation Easement Area developed pursuant to this Conservation Easement.

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

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

D. Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause

financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

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

V. 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.

VI. MISCELLANEOUS

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

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

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

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

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

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

Division of Mitigation Services Program Manager
NC 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.

VII. 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 the Property 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)
Janie B. Mangum

_____ (SEAL)
Robert W. Mangum

NORTH CAROLINA
COUNTY OF _____

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

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the _____ day _____ of _____, 20 .

Notary Public

My commission expires:

NORTH CAROLINA
COUNTY OF _____

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

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the _____ day _____ of _____, 20 .

Notary Public



My commission expires:

EXHIBIT A

*A Conservation Easement for The State of North Carolina,
NCDEQ: Division of Mitigation Services,
“Mangum Homestead Mitigation Site”
Property of: Janie B. Mangum and Robert W. Mangum*
SPO FILE NO. XX-XX DMS SITE ID NO. 100107

Categorical Exclusion Form for Ecosystem Enhancement Program Projects Version 2

Note: Only Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	Mangum Homestead Mitigation Site
County Name:	Orange County
DMS Number:	100107
Project Sponsor:	Wildlands Engineering, Inc.
Project Contact Name:	Kirsten Gimbert
Project Contact Address:	1430 S. Mint Street, Suite 104, Charlotte, NC 28203
Project Contact E-mail:	kgimbert@wildlandseng.com
DMS Project Manager:	Jeremiah Dow
Project Description	
<p>The Mangum Homestead Mitigation Site is being developed to provide nutrient offset and buffer mitigation. The project includes buffer restoration, enhancement, and preservation on four unnamed tributaries and one ephemeral channel that flow to New Hope Creek upstream of Jordan Lake. The project will reduce sediment and nutrient loading, provide and improve terrestrial and in stream habitats, and improve stream and bank stability. The area surrounding the streams and channels proposed for buffer restoration is currently agricultural fields, typically used to grow hay.</p>	
For Official Use Only	
Reviewed By:	
8/27/2019	 <hr style="width: 100%;"/>
Date	DMS Project Manager
Conditional Approved By:	
_____	<hr style="width: 100%;"/>
Date	For Division Administrator FHWA
<input type="checkbox"/> Check this box if there are outstanding issues	
Final Approval By:	
8-27-19	 <hr style="width: 100%;"/>
Date	For Division Administrator FHWA



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Raleigh Field Office
P.O. Box 33726
Raleigh, NC 27636-3726

Date: _____

Self-Certification Letter

Project Name _____

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Raleigh Ecological Services online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA), and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250), as amended (Eagle Act). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA and Eagle Act conclusions. Based on your analysis, mark all the determinations that apply:

“no effect” determinations for proposed/listed species and/or proposed/designated critical habitat; and/or

“may affect, not likely to adversely affect” determinations for proposed/listed species and/or proposed/designated critical habitat; and/or

“may affect, likely to adversely affect” determination for the Northern long-eared bat (*Myotis septentrionalis*) and relying on the findings of the January 5, 2016, Programmatic Biological Opinion for the Final 4(d) Rule on the Northern long-eared bat;

“no Eagle Act permit required” determinations for eagles.

We certify that use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the “no effect” or “not likely to adversely affect” determinations for proposed and listed species and proposed and designated critical habitat; the “may affect” determination for Northern long-eared bat; and/or the “no Eagle Act permit required” determinations for eagles. Additional coordination with this office is not needed. Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species. Should project plans change or if additional information on the distribution of proposed or listed species, proposed or designated critical habitat, or bald eagles becomes available, this determination may be reconsidered. This certification letter is valid for 1 year. Information about the online project review process including instructions, species information, and other information regarding project reviews within North Carolina is available at our website <http://www.fws.gov/raleigh/pp.html>. If you have any questions, you can write to us at Raleigh@fws.gov or please contact Leigh Mann of this office at 919-856-4520, ext. 10.

Sincerely,

/s/Pete Benjamin

Pete Benjamin
Field Supervisor
Raleigh Ecological Services

Enclosures - project review package



North Carolina Department of Natural and Cultural Resources
State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

August 12, 2019

Kirsten Gimbert
Wildlands Engineering
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Re: Mangum Homestead Mitigation Site, Orange County, ER 19-2118

Dear Ms. Gimbert:

Thank you for your letter of June 14, 2019, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

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

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

Sincerely,

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

for Ramona Bartos, Deputy
State Historic Preservation Officer

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)	Date Of Land Evaluation Request 7/3/19
Name Of Project Mangum Homestead Mitigation Site	Federal Agency Involved FHWA
Proposed Land Use Buffer & Nutrient Restoration	County And State Orange County, NC

PART II (To be completed by NRCS)		Date Request Received By NRCS 7/3/19	
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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>
		Acres Irrigated none	Average Farm Size 88 acres
Major Crop(s) CORN	Farmable Land In Govt. Jurisdiction Acres: 245,406 acvres % 96	Amount Of Farmland As Defined in FPPA Acres: 203,636 acres % 90	
Name Of Land Evaluation System Used Orange Co., NC LESA	Name Of Local Site Assessment System N/A	Date Land Evaluation Returned By NRCS July 24, 2019 by eMail	

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	19.7			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	19.7	0.0	0.0	0.0

PART IV (To be completed by NRCS) Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	8.2			
B. Total Acres Statewide And Local Important Farmland	8.7			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0083			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	92.8			

PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	62	0	0	0
--	----	---	---	---

PART VI (To be completed by Federal Agency) Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))	Maximum Points				
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	20			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	15			
6. Distance To Urban Support Services	15	10			
7. Size Of Present Farm Unit Compared To Average	10	1			
8. Creation Of Nonfarmable Farmland	10	0			
9. Availability Of Farm Support Services	5	5			
10. On-Farm Investments	20	3			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	0			
TOTAL SITE ASSESSMENT POINTS	160	99	0	0	0

PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)	100	62	0	0	0
Total Site Assessment (From Part VI above or a local site assessment)	160	99	0	0	0
TOTAL POINTS (Total of above 2 lines)	260	161	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
----------------	-------------------	--

Reason For Selection:

Mangum Homestead

1449 Foggy Bottom Lane
Hillsborough, NC 27278

Inquiry Number: 5508907.2s
December 11, 2018

The EDR Radius Map™ Report with GeoCheck®



6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

1449 FOGGY BOTTOM LANE
HILLSBOROUGH, NC 27278

COORDINATES

Latitude (North): 35.9970100 - 35° 59' 49.23"
Longitude (West): 79.1457700 - 79° 8' 44.77"
Universal Transverse Mercator: Zone 17
UTM X (Meters): 667136.7
UTM Y (Meters): 3985006.2
Elevation: 606 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 5945603 WHITE CROSS, NC
Version Date: 2013

Northwest Map: 5947915 EFLAND, NC
Version Date: 2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20140619
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:
1449 FOGGY BOTTOM LANE
HILLSBOROUGH, NC 27278

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
--------	-----------	---------	-------------------	--------------------	----------------------------

NO MAPPED SITES FOUND

EXECUTIVE SUMMARY

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
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

FEDERAL FACILITY..... Federal Facility Site Information listing
SEMS..... Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE..... Superfund Enterprise Management System Archive

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

LUCIS..... Land Use Control Information System
US ENG CONTROLS..... Engineering Controls Sites List

EXECUTIVE SUMMARY

US INST CONTROL..... Sites with Institutional Controls

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

LAST..... Leaking Aboveground Storage Tanks

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

LUST TRUST..... State Trust Fund Database

State and tribal registered storage tank lists

FEMA UST..... Underground Storage Tank Listing

UST..... Petroleum Underground Storage Tank Database

AST..... AST Database

INDIAN UST..... Underground Storage Tanks on Indian Land

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

HIST LF..... Solid Waste Facility Listing

EXECUTIVE SUMMARY

SWRCY.....	Recycling Center Listing
INDIAN ODI.....	Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9.....	Torres Martinez Reservation Illegal Dump Site Locations
ODI.....	Open Dump Inventory
IHS OPEN DUMPS.....	Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL.....	Delisted National Clandestine Laboratory Register
US CDL.....	National Clandestine Laboratory Register

Local Land Records

LIENS 2.....	CERCLA Lien Information
--------------	-------------------------

Records of Emergency Release Reports

HMIRS.....	Hazardous Materials Information Reporting System
SPILLS.....	Spills Incident Listing
IMD.....	Incident Management Database
SPILLS 90.....	SPILLS 90 data from FirstSearch
SPILLS 80.....	SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR.....	RCRA - Non Generators / No Longer Regulated
FUDS.....	Formerly Used Defense Sites
DOD.....	Department of Defense Sites
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR.....	Financial Assurance Information
EPA WATCH LIST.....	EPA WATCH LIST
2020 COR ACTION.....	2020 Corrective Action Program List
TSCA.....	Toxic Substances Control Act
TRIS.....	Toxic Chemical Release Inventory System
SSTS.....	Section 7 Tracking Systems
ROD.....	Records Of Decision
RMP.....	Risk Management Plans
RAATS.....	RCRA Administrative Action Tracking System
PRP.....	Potentially Responsible Parties
PADS.....	PCB Activity Database System
ICIS.....	Integrated Compliance Information System
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS.....	Material Licensing Tracking System
COAL ASH DOE.....	Steam-Electric Plant Operation Data
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER.....	PCB Transformer Registration Database
RADINFO.....	Radiation Information Database
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS.....	Incident and Accident Data
CONSENT.....	Superfund (CERCLA) Consent Decrees
INDIAN RESERV.....	Indian Reservations
FUSRAP.....	Formerly Utilized Sites Remedial Action Program
UMTRA.....	Uranium Mill Tailings Sites
LEAD SMELTERS.....	Lead Smelter Sites

EXECUTIVE SUMMARY

US AIRS.....	Aerometric Information Retrieval System Facility Subsystem
US MINES.....	Mines Master Index File
ABANDONED MINES.....	Abandoned Mines
FINDS.....	Facility Index System/Facility Registry System
DOCKET HWC.....	Hazardous Waste Compliance Docket Listing
ECHO.....	Enforcement & Compliance History Information
UXO.....	Unexploded Ordnance Sites
FUELS PROGRAM.....	EPA Fuels Program Registered Listing
AIRS.....	Air Quality Permit Listing
ASBESTOS.....	ASBESTOS
COAL ASH.....	Coal Ash Disposal Sites
DRYCLEANERS.....	Drycleaning Sites
Financial Assurance.....	Financial Assurance Information Listing
NPDES.....	NPDES Facility Location Listing
UIC.....	Underground Injection Wells Listing
AOP.....	Animal Operation Permits Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto.....	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner.....	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS.....	Recovered Government Archive State Hazardous Waste Facilities List
RGA LF.....	Recovered Government Archive Solid Waste Facilities List
RGA LUST.....	Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

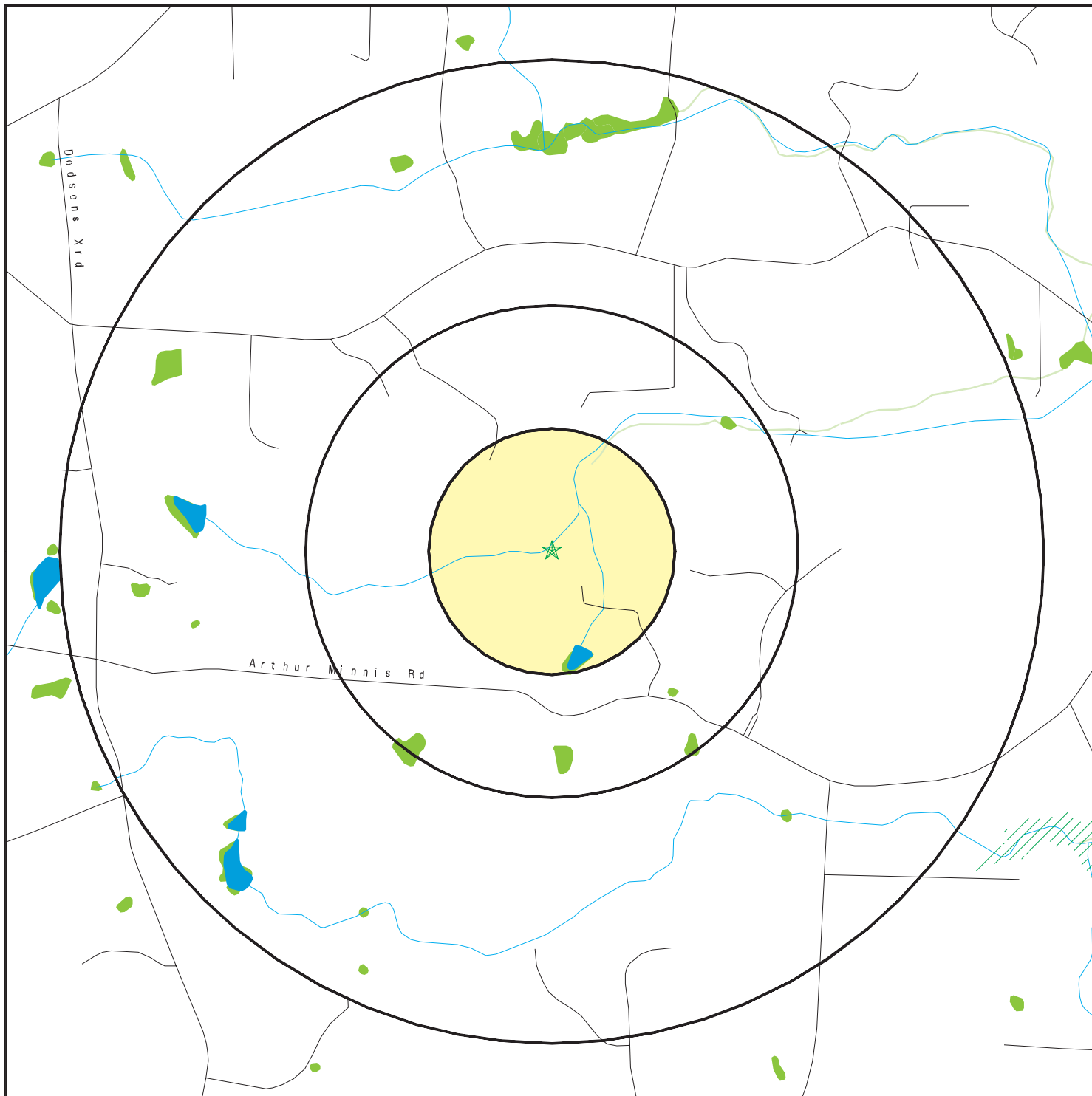
Surrounding sites were not identified.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5508907.2S



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

▲ Manufactured Gas Plants

■ National Priority List Sites

■ Dept. Defense Sites



■ Indian Reservations BIA

■ 100-year flood zone

■ 500-year flood zone

■ National Wetland Inventory

■ State Wetlands

■ Hazardous Substance Disposal Sites

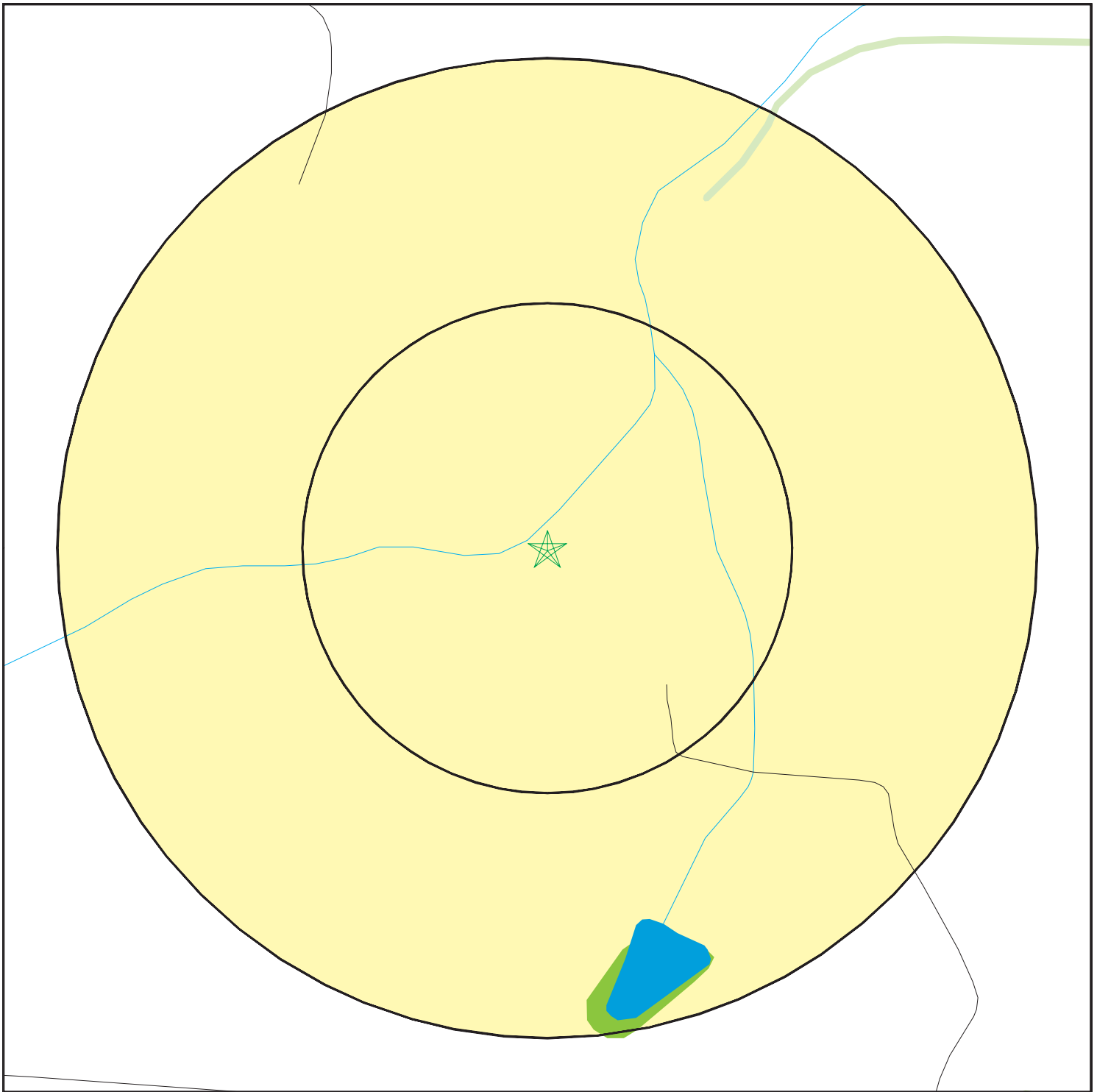


This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Mangum Homestead
 ADDRESS: 1449 Foggy Bottom Lane
 Hillsborough NC 27278
 LAT/LONG: 35.99701 / 79.14577

CLIENT: Wildlands Eng, Inc.
 CONTACT: Andrea Eckardt
 INQUIRY #: 5508907.2s
 DATE: December 11, 2018 3:52 pm

DETAIL MAP - 5508907.2S



- ★ 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
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites



This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Mangum Homestead
 ADDRESS: 1449 Foggy Bottom Lane
 Hillsborough NC 27278
 LAT/LONG: 35.99701 / 79.14577

CLIENT: Wildlands Eng, Inc.
 CONTACT: Andrea Eckardt
 INQUIRY #: 5508907.2s
 DATE: December 11, 2018 3:54 pm