

MITIGATION PLAN

FINAL

October 5, 2020

HONEY MILL MITIGATION SITE

Surry County, NC NCDEQ Contract No. 7619 DMS ID No. 100083

Yadkin River Basin HUC 03040101

USACE Action ID No. SAW-2018-01789 NC DWR No. 20181271 RFP #: 16-00746 (Issued 12/7/2017)

PREPARED FOR:



NC Department of Environmental Quality Division of Mitigation Services 1652 Mail Service Center 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:

- Federal rule for compensatory mitigation project sites as described in the Federal Register Title 33 Navigation and Navigable Waters Volume 3 Chapter 2 Section § 332.8 paragraphs (c)(2) through (c)(14).
- 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:

Aaron Earley, PE, CFM Project Manager Shawn Wilkerson, Principal in Charge Ian Eckardt, PWS, Wetland Delineations Ella Wickliff, Project Scientist Christine Blackwelder, Stream Design Jesse Kelley, Construction Documents Emily Reinicker, PE, CFM, Lead Quality Assurance



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

October 5, 2020

Regulatory Division

Re: NCIRT Review and USACE Approval of the NCDMS Honey Mill Mitigation Site / Surry Co./ SAW-2018-01789/ NCDMS Project # 100083

Mr. Tim Baumgartner North Carolina Division of Mitigation Services 1652 Mail Service Center Raleigh, NC 27699-1652

Dear Mr. Baumgartner:

The purpose of this letter is to provide the North Carolina Division of Mitigation Services (NCDMS) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day comment period for the Honey Mill Draft Mitigation Plan, which closed on August 22, 2020. These comments are attached for your review.

Based on our review of these comments, we have determined that no major concerns have been identified with the Draft Mitigation Plan, which is considered approved with this correspondence. However, several minor issues were identified, as described in the attached comment memo, which must be addressed in the Final Mitigation Plan.

The Final Mitigation Plan is to be submitted with the Preconstruction Notification (PCN) Application for Nationwide permit approval of the project along with a copy of this letter. Issues identified above must be addressed in the Final Mitigation Plan. All changes made to the Final Mitigation Plan should be summarized in an errata sheet included at the beginning of the document. If it is determined that the project does not require a Department of the Army permit, you must still provide a copy of the Final Mitigation Plan, along with a copy of this letter, to the appropriate USACE field office at least 30 days in advance of beginning construction of the project. Please note that this approval does not preclude the inclusion of permit conditions in the permit authorization for the project, particularly if issues mentioned above are not satisfactorily addressed. Additionally, this letter provides initial approval for the Mitigation Plan, but this does not guarantee that the project will generate the requested amount of mitigation credit. As you are aware, unforeseen issues may arise during construction or monitoring of the project that may require maintenance or reconstruction that may lead to reduced credit.

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please call me at 919-554-4884, ext 60.

Sincerely,

Kim Browning Mitigation Project Manager *for* Ronnie Smith, Deputy Chief USACE Regulatory Division

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List Paul Wiesner, Kelly Phillips—NCDMS Aaron Earley—WEI



October 5, 2020

Ms. Kim Browning Mitigation Project Manager United States Army Corps of Engineers 69 Darlington Avenue Wilmington, NC 28403-1343

Subject: Mitigation Plan Report and Construction Plans Honey Mill Mitigation Site, Surry County Yadkin River Basin HUC 03040101 DMS Project ID #100083 USACE #SAW-2018-01789

Dear Ms. Browning:

Thank you for your September 15, 2020 comment letter for the Honey Mill Mitigation Site draft mitigation report and plans. We have made the necessary revisions to the draft documents and we are submitting revised versions of the documents along with this letter. Below we provide your comments followed by our responses in bold italics.

WRC Comments, Andrea Leslie

- 1) As noted previously in an early review letter provided directly to the applicant, wild trout reproduction should not be impacted by this project, and a trout moratorium is notneeded.
 - a) Noted thank you.
- 2) Sambucus nigra is a European species of elderberry, but sometimes the native elderberry is included in this group. Ensure that they are using the native elderberry (Sambucus canadensis).
 - a) This error has been fixed. The native elderberry (Sambucus cavadensis) now replaces the European elderberry in the planting table.
- 3) Sweetbay magnolia is primarily a coastal plain species. Although it might be found in rare seepage wetlands in this part of the state, it would not occur as a native species on typical stream banks.

a) Sweetbay magnolia (Magnolia virginiana) has been removed from the planting list.

4) Lindera melissifolia is a federally listed species of boggy coastal plain sites. Do they mean Lindera benzoin, which would be a fine understory planting?

a) This error has been fixed. Spicebush (Lindera benzoin) is now listed in the planting table.

5) River birch is not often found on small streams – it's typically associated with large rivers. Unless it is found on site already, we recommend eliminating it and replacing it with somethingelse.

- a) River birch (Betula nigra) has been removed from the planting list. Wildlands has made this change due to the site being on the edge of its native range in NC rather than it's association with larger streams. Matthews (2011) supports that river birch is frequently associated with small stream and narrow floodplains in addition to palustrine areas.
- 6) Acer negundo is also typically associated with larger streams, as well.
 - a) While boxelder (Acer negundo) is commonly associated with larger streams and natural levee forests, it is also found in floodplains and palustrine areas of smaller streams (LeGrand et al., 2020; Matthews, 2011; Schafale & Weakley, 1990). Wildlands argues that boxelder is an appropriate planted species for this site at the proposed planting rate since it is documented to inhabit floodplains of smaller streams as documented by LeGrand et al. (2020) and Matthews (2011). Furthermore, boxelder grows quickly in open areas and serves as a valuable 'nurse tree' providing more favorable growing conditions for slower grower tree species (i.e. oaks) that establish better in partially shaded environments.
- 7) Eliminate silver maple from the planting list –it is very limited in North Carolina, and it wouldn't be found on small streams.
 - a) Silver maple (Acer saccharinum) has been removed from the planting list.
- 8) Cut down on the % of sycamore planted (20% of stems).
 - a) Sycamore (Platanus occidentalis) has been reduced to 15% of stems in the riparian planting zone.
- 9) It appears that 'riparian planting' areas will not include understory species. The 'shaded supplemental planting' list has a nice diversity of subcanopy and shrub layers – we recommend bringing some of these species into the 'riparian planting' areas. Could they include other species already found on site in the riparian planting list?
 - a) American strawberry bush (Euonymus americanus), red mulberry (Morus rubra) and witch hazel (Hamamelis virginiana) have been added to the riparian planting zone list. Additionally, paw paw (Asimina triloba) and sourwood (Oxydendrum arboreum) will also occupy the subcanopy layer in this planting zone.

WRC Comments, Travis Wilson

- 10) The draft plan does not include a detail of the stream crossings. It states the crossings are all existing utility, ford, or culvert crossing but then mentions the culverts will be buried. Therefore, I am assuming the crossing locations are existing but the structures will be reset to the restored profile. If that is the case a detail showing the ford crossing and the culvert crossing should be included.
 - a) A culvert crossing detail and a ford crossing detail are now provided. Please see detail 1/6.10 and 2/6.10 in the plans.

EPA Comments, Todd Bowers

- 11) I wish to convey that I while I understand that Surry County is considered "mountain" for the purposes of generating mitigation credit, this site does not seem to meet the qualification of a "mountain stream" but rather a "piedmont stream". I have several reasons for this consideration.
 - a) The site elevation ranges within the current proposed conservation easement between approximately 980- and 1,050-feet above sea level. According the NC Wildlife Resources Commission, "the piedmont physiographic ecoregion elevations range from about 1,500 feet in the foothills to about 200 feet at the fall line." This site would be located in the piedmont from that perspective.
 - b) According to the sponsor and the draft mitigation plan, "the Site is located in the Tugaloo terrane of the Piedmont physiographic province (NCGS, 2018). The Piedmont Province is characterized by rolling, well rounded hills and long low ridges, with elevations ranging from 300 to 1500 feet above sealevel."
 - c) Cool water streams, while more common in the mountains of North Carolina, do exist widely in the NC piedmont.
 - d) Many of the reference sites used to guide restoration of the site streams are located in the piedmont ecoregion. According to the sponsor, "due to the variety of slopes and project stream types present on the Site, the distribution of reference reaches is wide, throughout North Carolina's foothills and western Piedmont."
 - e) The NC SAM zone used to evaluate the streams within the project boundaries is listed as "Piedmont".
 - f) According to Section 7.3.5 (Page 15-16), Wildlands developed a regional flood frequency analysis tool that tailored the USGS 2009 publication "Magnitude and Frequency of Rural Floods in the Southeastern United States, through 2006" to the Piedmont of North Carolina and used several gages located in the Piedmont to develop flood frequency intervals for the project streams.

i) Wildlands acknowledges your above considerations.

- 12) Since the site appears to have more piedmont than mountain characteristics, I highly recommend that the sponsor reconsider the minimum buffer widths and conservation easement boundaries of this project. The draft mitigation plan lists several instances where discreet constructed BMPs are needed to offset drainage and polluted runoff from the surrounding landscape. The land surrounding the site will continue to be used for livestock grazing following the establishment of the conservation easement and completed fencing. The primary stressor on water quality for the project streams will continue to be runoff from livestock excrement and the best BMP to counter this stress is wider vegetated stream buffers. The sponsor even states on page 23 that additional floodplain vegetation would lower the risk to the site from agricultural runoff. Therefore, I recommend that the site incorporate 50-foot minimum riparian buffer widths. This will have the added effect of protecting the stream floodplains and the pockets of wetlands contained within.
 - a) While Wildlands agrees that wider buffers always offer greater protection, we have provided the required buffer widths as outlined in the governing rules and regulations (Wilmington District 2003 Stream Mitigation Guidelines and the October 24, 2016 Stream and Wetland Compensatory Mitigation Update). Our option agreements were set for 30-foot buffers based on this guidance during the proposal stage of the project. The easements for the site

are recorded with the 30-foot buffers presented in the plans.

- 13) I recommend that the vegetation height requirement for satisfactory performance of vegetative vigor be increased from 8 to 10 feet at the conclusion of the 7- year monitoring period. The elevation of the project is not sufficiently high enough to warrant the use of the lower standard used for mountain streams.
 - a) Wildlands has set the vegetation height standards per requirements set forth in Section V.B.2 in the NC IRT October 24, 2016 Stream and Wetland Compensatory Mitigation Update no change has been made.
- 14) With the recommended wider buffers, I also recommend a corresponding increase in the number of vegetation plots to monitor the vigor of planted trees.
 - a) The number of vegetation plots presented corresponds to the required buffer width recorded and presented in the plan no change has been made.
- 15) The planting plan for the site appears adequate and appropriate for both canopy and subcanopy species. Recommend listing the species that will be considered for the final height requirement performance standard as some will not likely meet the 10-foot requirement at the end of the proposed monitoring period; namely those considered for shaded supplemental planting. I also recommend that any significant deviations from the planting plan are approved by the IRT before purchase and planting.
 - a) Species that will not be considered for the final height requirement are indicated in the tables by an asterisk. They include red mulberry (Morus rubra), sourwood (Oxydendrum arborea), paw paw (Asimina triloba), witch hazel (Hamamelis virginiana), American strawberry bush (Euonymus americanus), ironwood (Carpinus caroliniana), sweetshrub (Calycanthus floridus), spicebush (Lindera benzoin), flowering dogwood (Cornus florida), and American holly (Ilex opaca).

USACE Comments, Kim Browning

- 16) Figure 9: the veg plot on Venable Creek R2 should be relocated to the confluence of R3 and UT2, to include the existing wetland.
 - a) The vegetation plot was relocated to the wetland at the confluence of Venable Creek Reach 3 and UT2.
- 17) Design sheets general note: Please ensure that when measuring the centerline of the channel for crediting purposes that only one channel is measured at a confluence. An example is on Sheet 2.36 where it appears that both channels are measured. Additionally, please ensure that the centerline is used for crediting determination, not the thalweg. This is unclear on sheets 2.1 and 2.5.

a) Station callouts and crediting were adjusted at the tributary confluences, and centerline adjustments were made on Venable Creek Reach 1, 2, and 4.

18) Field notes indicate that the confluence of UT2 and UT2A is a wetland complex and would be best suited as a wetland. This plan proposes single-thread restoration in this area. Please note the concern of the IRT for this area to demonstrate wetland like characteristics and be willing to document a single-thread channel throughout the monitoring period.

- b) Visual documentation of a single-thread channel on UT2 Reach 2 through the wetland complex throughout the monitoring period has been added to the monitoring criteria. See Section 8.1.2 of the revised mitigation plan.
- 19) Page 6 discusses UT2B; I'm unclear where this is on the Figures. (Perhaps it's the small unlabeled line outside the easement?)
 - a) UT2B was added to the figures. UT2B is located just upstream of the Venable Creek Reach 3 and Reach 4 break.
- 20) Section 7.2.4: It would be interesting to note the approximate number of mature trees that are left on-site in areas where restoration will occur and note the survival rate of these existing trees through the monitoring period. On the Agony Acres site, we noticed that a large number of mature trees that were left in the buffer were actually damaged during construction and began to die between MY4 and MY5. This is just an observation and the data would be interesting to see, not just on this site.
 - a) Wildlands has added two monitoring photo points to visually assess representative mature tree save areas. The location of these photo points will be established post-construction. Please reference Table 16, note 8, in the mitigation plan.
- 21) Section 7.1: It would be beneficial to discuss the potential for utility line maintenance, and the road culverts to be replaced/widened on Siloam Rd (UT1) and Little Mountain Church Rd (Venable Creek R1). It appears that the conservation easement is at least 50 ft from the road right-of-way, which is appreciated.
 - a) This discussion is now included in Section 7.10, Project Risks and Uncertainties.
- 22) Section 7.9: There is some concern regarding the fact that the landowner is responsible for installing the livestock watering facilities in relation to the fact that at least one of the crossings is a ford crossing. Please confirm that these crossings will not be used for livestock access for drinking if the landowner fails to install the watering tanks.
 - a) The ford crossing is in an internal easement break and will be fenced, gated, and only used for coordinated crossing events. The conservation easement language requires the landowner to restrict livestock access in the conservation easement. Table 14 outlines that livestock will only access the ford during coordinated crossing events.

DWR Comments, Erin Davis

- 23) Page 4, Section 3.2 DWR appreciates that Surry County planning documents were reviewed for this plan.
 - a) Noted thank you.
- 24) Page 6, Section 3.4 Is the location of UT2B mapped on any of the plan figures? If not, can the approximate location please be called out on Figure 2 (within and/or outside of theeasement).
 - a) UT2B was added to the figures. UT2B is located just upstream of the Venable Creek Reach 3 and Reach 4 break.
- 25) Page 9, Section 4.1 There are five BMPs shown on Figure 9, but only four points of inputs are mentioned in the text. Please clarify.

- b) This section now references five potential agricultural input areas. Please refer to Section 7.7 for discussion on the BMPs.
- 26) Page 10, Section 4.5 There are two areas of Wetland C that aren't captured within the conservation easement. Was protection of these resource areas discussed during site planning?
 - a) Wetland C is heavily accessed by cattle currently. The portion of the wetland not within the conservation easement is an area required by the landowner to access the culvert crossing on UT2. The local topography prohibited another approach to this crossing. Wildlands has accounted for the impact to this wetland in the PCN.
- 27) Page 11, Section 5.3 DWR requests a groundwater gauge be installed in existing Wetland K where hydrology may be impacted by proposed stream relocation in order to demonstrate no significant functional loss of the resource.
 - a) The existing onsite wetlands are not proposed for mitigation credit; therefore, no groundwater gauges are proposed.
- 28) Page 13, Section 7.1 This section notes that wetland hydrology was assessed with groundwater gages. I suspect this is a carryover, but if gage data is available please include it in the final mitigation plan.
 - a) Wetland hydrology was not assessed with gauges since wetlands are not proposed for mitigation credit. The erroneous reference has been removed from Section 7.1.
- 29) Page 21, Section 7.6 DWR appreciates that an effort was made to capture the tributary origins within the conservation easement. Please confirm whether the UT2 stream origin is included (Sheet 2.12), and if it's not please explain why not (e.g. UT2A ends at propertyline).
 - a) UT2's intermittent origin is within the conservation easement.
- 30) Page 22, Section 7.8 Please include at least one target community for the proposed planting plan. DWR would like to see a mix of early successional native species and appropriate climax species based on the designated target community.

a) This information is now included in Section 7.8.

31) Page 26, Table 15 – There are differences in the goals and objectives compared to Table 6. Please review.

a) Goals and objectives from Tables 6 and 15 now match.

- 32) Page 29, Section 10 DWR recommends an annual inspection of the site.
 - a) This language comes from the most recent DMS mitigation plan template (June 2017). DMS let us know this language was reviewed by the IRT and DEQ Stewardship prior to the issuance of the mitigation plan template and guidance. DMS has requested that the approved language remain in the mitigation plan as provided. Per DEQ Stewardship, DMS mitigation sites accepted by the DEQ Stewardship program will be inspected every one to three (maximum) years. Language in Table 18 has been updated to reflect the one to three year inspection frequency.
- 33) Page 30, Section 11 Please confirm whether Wildlands or DMS would notify the NCIRT of site issues.
 - a) The section now states that Wildlands and DMS will coordinate with the IRT if remedial actions are necessary.

- 34) Page 30, Section 12 The memo referenced for the credit ratios includes a summary table in which management objectives for UT2R1, UT2A, UT3R1, UT4, UT5, and UT6R1 specifies "spot repair erosion and incision". However, only design sheets for UT4 show any stream work. Please explain why spot erosion and incision areas identified during the proposal stage were not addressed in the design stage.
 - a) The proposal approaches were field walked with the IRT, who noted less impacts than observed by Wildlands field scientists during proposal development. The IRT reduced crediting ratios on these streams to reflect the reduced approaches. Please refer to the IRT meeting minutes and mapping in Appendix 6.
- 35) Figure 9 DWR requests the veg plot along Venable Creek Reach 2 be shifted downstream to near the next set of cross sections along Reach 3.
 - a) The vegetation plot was shifted to incorporate the wetland at the confluence of Venable Creek Reach 3 and UT2.
- 36) Appendix 3 Was NCWAM completed for the existing wetlands onsite? If so, please include the corresponding forms. Also, two of the NCSAM rating sheets did not include an overall rating score, please QAQC.
 - a) NCWAM forms were not completed since the existing wetlands are not proposed for mitigation credit. NCSAM forms for Venable Creek 3, UT3 Reach 2, and UT4 have been updated.
- 37) Sheet 0.3 Please include roadway right-of-way boundary lines.
 - a) The parcel boundary lines indicate the 60' right-of-way on Siloam Road and the 50' right-ofway on Venable Farm Road. No additional lines were added.
- 38) Sheet 2.1 Are there any existing utility poles located within the internal crossing?
 - a) There are no utility poles within the internal crossing.
- 39) Sheet 2.2 Will the existing farm road be relocated just outside of the easement? Are impacts to Wetland B expected/accounted for?
 - a) The existing farm road will be relocated outside of the easement. All wetland impacts are accounted for in the PCN.
- 40) Sheet 2.2 The BMP detail (Sheet 6.9) includes an outlet channel, please show the approximate location of this outlet channel on the plan view sheets (Sheets 2.2, 2.7 and 2.34).
 - a) This information has been added.
- 41) Sheet 2.12 The Enhancement II Treatment Note #4 is confusing to see on sheets that do not show any grading (Sheets 2.12-2.15, 2.18-2.22, 2.24-2.26 and 2.32). If spot grading is proposed, please show on the sheets.

a) The Enhancement II treatment notes were revised for each plan sheet and areas receiving spot grading are indicated on the plans.

42) Sheet 2.12 & 2.32 – Figure 2 indicates headcuts in the upper sections of UT2 and UT5. No stream work is proposed for these reaches. Is further instability of these headcuts a concern? Monitoring photo points may be helpful at these locations.

- b) The proposal approaches were field walked with the IRT, who noted less impacts than observed by Wildlands field scientists during proposal development. The IRT reduced crediting ratios on these streams to reflect the reduced approaches. Please refer to the IRT meeting minutes and mapping in Appendix 6. Photo points will be added to monitor the areas of concern on UT2 and UT5.
- 43) Sheet 2.16 Please include a typical detail for the proposed culvertcrossing.
 - a) This detail is now included. Please see detail 2/6.10.
- 44) Sheet 2.3 DWR recommends that bench width be at least 1.5 times bankfull width. Particularly of concern are the bench widths on the outer meander bends where much of the flow energy vectors are directed.
 - a) Brush toe will be installed along the outer meander bend to add stability to the streambanks and help prevent meander migration.
- 45) Sheet 2.4 UT2 and UT3 are designed to tie in to Venable Creek at meander bends rather than riffle straights. Are there any long-term stability concerns for these meanderareas?
 - a) The elevation at the downstream extent of both streams match the downstream head of riffle elevation on Venable Creek, and these bends are protected with brush toe, which will prevent meander migration. Wildlands does not have long term stability concerns for these ties.
- 46) Sheet 2.8 A ford crossing detail was not provided. With the existing bedrock I understand that the streambed doesn't require reinforcement, but are the side slopes/access path areas stable? Is any grading proposed? Will any riprap be placed along the banks?

a) This detail is now included. Please see detail 1/6.10.

- 47) Sheet 3.1
 - a) DWR questions whether sweetbay magnolia is an appropriate species for site based on the species geographic range
 - i) Sweetbay magnolia (*Magnolia virginiana*) has been removed from the planting list.
 - b) It would be helpful for our review to have the wetland indicator status included in the tables.
 - i) The wetland indicator status has been added for each species.
 - c) DWR understands that quantity substitutions may be necessary based on the nursery's species available. However, we request that no species (excluding live stakes) account for more than 20 percentage of a specified planting zone in order to promote diversity within the designated community type.

i) All riparian planting zone species are below 20 percent of total planted stems.

- 48) Sheet 6.9 Will herbaceous plugs be installed in the shallow water planting zone of the bioretention cells? I think fox sedge is the only OBL species in proposed seedmix.
 - a) Herbaceous plugs and wetland bare roots will be planted within the shallow water zone in the BMP.

- 50) Are channel plugs proposed? If so, please indicate approximate locations and include a typical detail.
 - a) Channel plugs are not proposed within the plans. Channel plugs may be installed during construction, if needed, at the discretion of the engineer.
- 51) Please include an overall fencing plan indicating existing and proposed fencing and approximate locations of anticipated gates.
 - a) A fencing plan is now included with the plans. See sheets 7.1-7.6.

Please contact me at 704-332-7754 extension 109 if you have any questions.

Thank you,

an S. Earley

Aaron Earley, PE, CFM Senior Water Resources Engineer

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APPENDICES

- Appendix 1 Historic Aerial Photos
- Appendix 2 Preliminary Jurisdictional Determination
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1.0 Introduction

The Honey Mill Mitigation Site (Site) is in Surry County approximately 5 miles south of Mount Airy and 7 miles northeast of Dobson (Figure 1). Venable Creek, a tributary to the Ararat River, and its associated tributaries will be restored and enhanced as part of this project. The Ararat River drains to the Yadkin River. The Yadkin-Pee Dee river basin covers an area of 7,200 square miles and many waters within the basin have been given a rating of impaired. The site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed Hydrologic Unit Code (HUC) 03040101110020 and is proposed for mitigation credit in the Upper Yadkin Catalog Unit 03040101 (Yadkin 01).

Eight unnamed tributaries (UT's) to Venable Creek (UT1, UT2, UT2A, UT2B UT3, UT4 UT5, and UT6) flow through the Site, as depicted in Figure 2. The Site streams are in various stages of impairment related to the current and historical agricultural land uses. The project proposes to restore, enhance, and preserve 8,901 existing linear feet of streams. The work proposed on the Site will provide 4,793.432 cool stream credits and will be protected in perpetuity by a 20.2-acre conservation easement as outlined in the Site Protection Instrument (Appendix 8).

The Site was instituted via the North Carolina Department of Environmental Quality Division of Mitigation Services (NCDEQ DMS) RFP # 16-007406. As approved by the North Carolina Interagency Review Team (NCIRT), all projects contracted under RFP # 16-007406 have a cool or warm service type. Penalties will not be assessed for using these project mitigation credits to satisfy cool or warm requirements

Project Information						
Project Name	Honey Mill Mitigation Site					
County	Surry					
Project Area (acres)	20.2					
Project Coordinates (latitude and longitude)	36° 25' 38.06"N 80° 36' 43.19"W					
Planted Acreage (acres of woody stems planted)	5 acres (full planting) plus supplemental planting					

Table 1: Project Attribute Table Part 1

2.0 Watershed Approach and Site Selection

The Site was selected based on its potential to support the objectives and goals of multiple conservation and watershed planning documents, outlined below.

- The 2009 Upper Yadkin River Basin Restoration Priorities (RBRP) states that a portion of the middle Ararat River in this watershed is impaired by turbidity and habitat degradation (DWQ, 2008) and links the impairment to degraded riparian buffers and unstable streambanks.
 Watershed goals outlined in the RBRP include restoration of water quality and aquatic habitat in impaired streams and implementation of agricultural BMPs in order to limit sediment, nutrients, and fecal coliform inputs to streams from active farming operations.
- The 2015 North Carolina Wildlife Resource Communion's (NCWRC) Wildlife Action Plan (WAP) notes that streams in the Yadkin River basin are impacted by excessive sedimentation and changes in hydrology and geomorphology due to development, agriculture, and instream mining. Water quality is also degraded due to excessive nutrient inputs from agriculture and



other wastewater discharges. The WAP discusses the importance of habitat conservation and restoration to address current problems affecting species and habitats.

The proposed project will exclude livestock, create stable stream banks, convert pasture to forest, and implement BMPs to filter agricultural runoff. These actions will address stressors identified in the RBRP and the WAP by reducing fecal, nutrient, and sediment inputs to project streams, and ultimately to the Ararat River, and will reconnect instream and terrestrial habitats on the Site to upstream and downstream resources. Approximately 20.2-acres of land will be placed under permanent conservation easement to protect the Site in perpetuity.

3.0 Baseline and Existing Conditions

The Site watershed (Table 2 and Figure 3) is in the northern portion of the Yadkin 01. It is situated in rural Surry County south of Mount Airy and northeast of Dobson, NC. The following sections describe the existing conditions of the Site, watershed, and watershed processes, including disturbance and response.

Project Information					
Physiographic Province	Piedmont				
Ecoregion	Northern Inner Piedmont				
River Basin	Yadkin River				
USGS HUC (8 digit, 14 digit)	03040101, 03040101110020				
NCDWR Sub-basin	03-07-03				
Project Drainage Area (acres)	705				
Project Drainage Area Percentage of Impervious Area	0.8%				
2011 NLCD Land Use C	assification				
Forest	65%				
Agricultural	21%				
Developed	9%				
Shrub/Scrub 5%					

Table 2: Project Attribute Table Part 2

3.1 Landscape Characteristics

3.1.1 Physiography, Topography, Geology, and Soils

The Site is located in the Tugaloo terrane of the Piedmont physiographic province (NCGS, 2018). The Piedmont Province is characterized by rolling, well rounded hills and long low ridges, with elevations ranging from 300 to 1500 feet above sea level. The Site topography, as indicated on the Mount Airy South, NC USGS 7.5 minute topographic quadrangle, shows a gradually sloped valley running through the center of the Site (Figure 3). The Tugaloo terrane is composed of metamorphosed sedimentary and volcanic rocks deposited on rifted continental and younger oceanic crust. The underlying geology of the Site is mapped as Late Proterozoic to Cambrian (500 to 900 million years in age) banded gneiss (CZbb). The unit is described as interlayered with calc-silicate rock, metaconglomerate, amphibolite, sillimanitemica schist, and granitic rock. Instances of exposed bedrock along project channels are mapped on Figure 2. Bedrock depth observed in areas proposed for stream restoration were several feet deeper than the proposed design and therefore are not expected to interfere with construction. In some areas,



the bedrock has been incorporated into the design. Venable Creek Reach 4 is bedrock controlled and thus vertically stable.

The proposed project is mapped by the Web Soil Survey for Surry County. Project area soils are described below in Table 3. Figure 5 provides a soil map of the Site.

Soil Name	Description
BbC- Braddock fine sandy loam	This series consists of very deep well drained soils on stream terraces, fans, and fan remnants. Available water capacity is moderate to high and shrink-swell potential is moderate. The profile consists of a brown fine sandy loam surface layer and a yellowish red clay subsoil layer.
CsA – Colvard and Suches soils	This series consists of very deep well drained soils typically found on floodplains. Available water capacity is high for Colvard class soils and moderately high for Suches class soils. Shrink-swell potential is low. The surface layer consists of dark yellowish brown fine sandy loam (Colvard) and brown loam (Suches). The subsoil consists of brown clay loam to dark yellowish-brown loam.
DeF – Devotion- Rhodhiss- Bannertown complex	This series consist of moderately deep to very deep soils that are somewhat excessively drained to well drained soils located on ridges and low hills. Shrink-swell potential is low and available water capacity is very low (Devotion and Bannertown) and moderate or high (Rhodhiss). Devotion series consists of a dark yellowish brown gravelly fine sandy loam surface layer and a brown gravelly fine sandy loam subsoil layer. Rhodhiss consists of a partially decomposed leaf litter and root mat with brown gravelly fine sandy loam surface layer and a brown loam to red loam subsoil layer. Bannertown consists of a dark brown gravelly fine sandy loam surface layer and a brown gravelly fine sandy loam to light yellowish brown gravelly fine sandy loam subsoil layer.
WfC2 – Woolwine- Fairview- Westfield complex	This series consists of moderately deep to very deep well drained soils typically found on interfluves, crests, side slopes, head slopes, and nose slopes. Shrink-swell potential is low and available water capacity is very low or low (Woolwine), moderate or high (Fairview), low or moderate (Westfield). Woolwine consists of a strong brown gravelly loam surface layer and a yellowish red clay to red gravelly clay subsoils layer. Fairview consists of a dark brown gravelly fine sandy loam surface layer, brown fine sandy loam subsurface layer, and a yellowish red sandy clay loam to red clay loam subsoil layer. Westfield consists of a dark brown gravelly fine sandy loam surface layer, brown fine sandy loam subsurface layer, and a yellowish red clay loam surface layer, brown fine sandy loam subsurface layer, and a yellowish red clay loam surface layer, brown fine sandy loam subsurface layer, and a yellowish red clay loam surface layer, brown fine sandy loam subsurface layer, and a yellowish red clay loam to red gravelly sandy clay loam subsoil layer.
WoD/WoE – Woolwine- Fairview- Westfield complex	This series consists of moderately deep to very deep well drained soils on ridges and low hills. Shrink-swell potential is low and available water capacity is very low or low (Woolwine), moderate or high (Fairview), low or moderate (Westfield). Same soil profile as WfC2.

Table 3: Project Soil Types and Descriptions

Source: Soil Survey of Surry County, North Carolina, USDA-NRCS, https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx

3.1.2 Watershed

The project begins at the intersection of Little Mountain Church Road and Venable Creek. The watersheds for UT3, UT4, and UT6 are roughly bound by Venable Farm Road to the west. All of the reach watersheds are encompassed by Venable Creek watershed, which extends south past Little Mountain Church Road. The Site is typically defined by forested and agricultural land use with sporadic development of rural homes. Wildlands conducted a watershed survey on March 31, 2020, to verify land uses observed in recent aerial photography and to gain an understanding of the various sources of sediment to Site streams.

Venable Creek's watershed is predominantly wooded in the headwaters, with one pasture present just upstream of Little Mountain Church Road. Venable Creek's banks are eroded within the pasture, which provides a fine sediment source to the project. UT1's watershed is predominantly forested on the hillslopes while the more gently sloped areas are in row crop production. UT1 is impounded downstream of the row crops, and this impoundment likely functions as a sediment sink for the watershed. Downstream of the impoundments, UT1 and its tributary flow through forest and pasture. Eroded sediments from stream banks are a minor sediment source to UT1. UT3, UT4, and UT6 all have eroded rills from nearby pastures contributing fine sediments at the inception point of the streams. Finally, an eroding farm road which enters the Venable Creek floodplain between UT4 and UT6 is a fine sediment source to Venable Creek.

3.2 Land Use/Land Cover

Land use and land cover, both past and present, were investigated throughout the Site and its watershed using historical aerials from 1950-2014 and through the March 31, 2020, watershed reconnaissance survey. Future land use potential was examined by reviewing the Surry County zoning boundaries and the Surry County Land Use Plan 2040 (Surry County Planning Board, 2019).

A review of historic aerials from 1950 to 2014 shows that onsite streams have existed in their approximate location for over 60 years, and that the agricultural management of the land has remained consistent as well. Historic aerial photos are provided for review in Appendix 1.

The Surry County Land Use Plan indicates that no population growth is anticipated in the county over the next two decades. The land within the watershed is zoned rural and remains rural in the future land use maps.

3.3 Existing Vegetation

UT1 and Venable Creek Reach 1 consist of narrow rows of woody vegetation including tag alder (*Alnus serrulata*) and white pine (*Pinus strobus*). The herbaceous pasture area is dominated by grasses (*Festuca* spp., *Pemmosetum* spp.), blackberry (*Rubus allegheniensis*), wood nettle (*Solanum viarum*), and multiflora rose (*Rosa multiflora*). At the beginning of Venable Creek Reach 2, the area becomes more forested with the canopy species including sycamore (*Platanus occidentalis*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), swamp chestnut oak (*Quercus michauxii*), red oak (*Quercus rubra*), and white oak (*Quercus alba*). In addition, mountain laurel (*Kalmia latifolia*) is found along the right bank steep bluff slopes. Throughout this reach, areas of Chinese privet (*Ligustrum sinense*), and multiflora rose were observed along both banks.

UT2 and UT2A's vegetation consists of mature canopy dominated by American beech, red maple, ironwood (*Carpinus caroliniana*), red oak, and white oak. UT2A and UT2 are located within a forested pasture where cattle have access. UT3's buffer consists of American holly (*Ilex opaca*), Virginia pine (*Pinus virginiana*), persimmon (*Diospyros virgiana*), and black walnut (*Juglans nigra*). Multiflora rose and Chinese privet are common along the stream banks in the understory throughout the tributary. UT4 is located within a forested pasture and includes American beech, red oak, and American holly with Chinese privet along the stream banks. UT5's vegetation consists of a mature forest dominated by American holly, ironwood, black walnut, swamp chestnut oak, red oak, and white oak with Christmas fern (*Polystichum acrostichoides*) as groundcover. UT6's buffer consists of American holly, American beech, black walnut, and invasive species including Chinese privet, multiflora rose, and Tree of heaven (*Ailanthus altissima*).



3.4 Project Resources

Wildlands investigated on-site jurisdictional waters of the United States (US) within the proposed project area. Potential jurisdictional areas were delineated using the US Army Corps of Engineers (USACE) Routine On-Site Determination Method. This method is defined by the 1987 Corps of Engineers Wetlands Delineation Manual and the subsequent Eastern Mountain and Piedmont Regional Supplement. Streams were classified using North Carolina Department of Water Resources (NCDWR) Classification Forms. Jurisdictional waters of the US were surveyed for inclusion on plans and figures. NCDWR stream identification forms are in Appendix 3. Tables 4 and 5 provide a summary of water resources within the project. Existing conditions and cross section locations are illustrated in Figure 2. Reach specific cross sections and geomorphic summaries are provided in Appendix 4.

Venable Creek

Venable Creek Reach 1 enters the Site from a 42" culvert under Little Mountain Church Road. Immediately downstream of the culvert, Venable Creek Reach 1 flows through the center of the moderately confined valley and has low but eroding banks due to cattle impacts. This reach is 100 LF long, and Reach 2 begins upstream of the UT1 confluence where Venable Creek starts to incise and the valley widens. Reach 2 has eroded down to bedrock and is laterally unstable with eroding stream banks. Reach 3 begins immediately after Venable Creek flows under an overhead power line. Reach 3 flows along the left valley wall despite a wide, alluvial right floodplain and exhibits widespread bank erosion and sections of incision. An eroding dirt farm road along the top of the steep left bank contributes sediment to Venable Creek. Downstream of the UT2 confluence, the left floodplain widens and the right floodplain narrows. Cattle have access to the stream from the right side, causing low, trampled banks. Venable Creek Reaches 1, 2, and 3 are characterized by a single row of trees along the top of banks with pasture beyond, several instances of exposed and undercut roots, and extensive cattle impacts. These reaches have minimal pattern and may have been

straightened to maximize farm fields in the past.

Venable Creek Reach 4 begins downstream of the UT3 confluence. Reach 4's valley is narrow and the stream flows against the hillside on the right side of the valley for most of the reach. The entire stream corridor is wooded, except for an open pasture in the left floodplain near the confluence with UT6. For approximately 600 feet downstream of UT3, the left top of bank is fenced, and the right floodplain is a steep hillside. There is a trail on the right hillside that is used to move cattle between pastures and cattle do not access the stream here. Cattle impacts are more frequent downstream of this 600-foot long section of Reach 4 and include several in-stream wallow areas. Although the bed is fairly stable due to numerous bedrock outcrops and cobble substrate, one or both banks are eroded or scoured along most of the reach. Reach 4 has more sinuosity than the upstream reaches of Venable Creek and has developed point bars on several meander bends. The valley pinches several times throughout the reach, including at the old mill near the downstream end of the project.



Venable Creek – Reach 3: Steep left bank and trampled right bank





Cross section surveys were conducted on Venable Creek Reaches 2 and 3. Reach 2 is most like an incised, straightened E4 with a bank height ratio of 1.6 and Reach 3 is most like an incised, straightened E/C4 with a bank height ratio of 1.3 to 1.6.

<u>UT1</u>

UT1 flows into the Site from a 6-ft X 7-ft concrete box culvert under Siloam Road. UT1 flows for approximately 180 feet before connecting to Venable Creek. The valley is wide and flat and consists of scrub brush and herbaceous vegetation. Cattle have full access to UT1 and have trampled the left bank for most of the reach. The reach is relatively straight and lacks bedform diversity. Bed material consists of a cobble and large gravel mixture.

A cross sectional survey of UT1 classified the channel as an incised E4b with a bank height ratio of 1.4.

UT2 and UT2A

UT2 Reach 1 originates as an intermittent stream at a headcut and flows through a confined, wooded valley over a series of steps and cobble riffles. UT2 transitions to a perennial channel after 15 LF. UT2A is a perennial channel that originates offsite and, similar to UT2 Reach 1, flows through a confined, wooded valley over steps and cobble riffles. Areas of bank erosion and scour are present on both streams where the channel flows along the hillside. There is minimal cattle impact on these steeper reaches. UT2 Reach 1's valley widens and flattens and a wetland has formed in the right floodplain as UT2 Reach 1 approaches the UT2A confluence.



UT2 Reach 2 begins at the UT2A confluence. Cattle impacts are extensive on Reach 2. Trampling has diverted stream flow away from the relic UT2 stream channel. A channel has formed to the north of the relic channel and flows along the base of an old barn. Historic aerials support the location of the observed relic channel. The existing channel has trampled, eroding banks. There is no bedform diversity and bed substrate consists of mud. Near the confluence with Venable Creek, the defined channel disappears and splays out into a soft, muddy depression. Reach 2's buffer is primarily herbaceous; no woody species are present. A cross sectional survey of UT2 Reach 2 classified the channel as a low sinuosity C4b.

UT2B

UT2B originates upstream of the project area within a confined valley. UT2B becomes perennial within the confined valley. Where UT2B enters the floodplain of Venable Creek, it transitions underground. UT2B is visible within a few sinkholes in the Venable Creek

floodplain.

<u>UT3</u>

UT3 Reach 1 begins at two hillside seeps on the western side of the Site that is also a cattle wallow area. Channel definition strengthens downstream of the wallow area. Cattle impact has caused erosion along the left bank for the majority of the reach but the stream bed is stabilized by multiple bedrock outcrops and cobble substrate. UT3 is relatively straight until it reaches the pasture adjacent to Venable Creek which marks the transition from Reach 1 to Reach 2. Reach 2 flows north along the woodline until the





confluence with Venable Creek. The buffer consists of sparse trees and scrubby vegetation. The right buffer along this lower section consists of a single row of trees. A cross sectional survey of UT3 Reach 2 classified the channel as an incised, low sinuosity E4b with a bank height ratio of 1.5.

<u>UT4</u>

Similar to UT3, UT4 begins as a seep within a cattle wallow area and flows through a confined wooded valley. Cattle impact along the entire UT4 reach is substantial, both within the channel and in the left floodplain. Degradation has resulted in several isolated areas of incision along UT4, but the stream is no longer incising and is vertically stable. The eroding banks and cattle paths to the creek are contributing a large volume of sediment to UT4 and Venable Creek.

<u>UT5</u>

UT5 is an intermittent channel that originates upstream of the easement within a narrow, wooded valley. The stream transitions to perennial 105 LF into the easement. Bed degradation has led to incision along the entire upstream section of the stream channel, but the stream is not eroded. As the channel reaches the flatter Venable Creek floodplain, it flows into a cattle wallow area. Cattle impact has diverted water away from the natural channel to form a new flow path. The relic channel is still intact and connects to Venable Creek. The bed material consists of a mixture of cobble and large gravel.

<u>UT6</u>

UT6 Reach 1 begins as a perennial channel at a hillside seep adjacent to a pasture on the northwestern side of the Site. The stream start is within a 100-foot wide powerline easement. The buffer is thick with brush and there are isolated sections of bank erosion and incision around bedrock knickpoints. UT6 Reach 2 begins just upstream of where a cattle crossing has diverted the flow away from the natural channel. Baseflow now follows the eroding cattle path, splays out into the floodplain of Venable Creek, and eventually flows into Venable Creek through a ditch. A cross sectional survey of the now abandoned UT6 Reach 2 classified the channel as an A4.





Table 4: Project Attribute Table Part 3

	Reach	Valley Confinement	Drainage	Peronnial	NCDWR	Str Classif	eam ication ¹	Evolutionary	
Parameter	Length (If)	(confined, moderately confined, unconfined)	Area (acres)	Intermittent (Int)	Water Quality Class.	Ex.	Prop.	Trend (Simon) ¹	FEMA
Venable Creek Reach 1		Moderately	183			N/A	N/A	N/A	
Venable Creek Reach 2	2022	confined	519	Demonsial		E4	B4	Ш	
Venable Creek Reach 3	3823	Unconfined	599	Perennial		E/C4	C4	IV	
Venable Creek Reach 4		Confined	705			N/A	N/A	N/A	
UT1	179	Unconfined	334	Perennial		E4b	C4b	111	
UT2 Reach 1	4454	Confined	21	Int.(15 LF)		N/A	N/A	N/A	
UT2 Reach 2	1154	Unconfined	43	Perennial	Class C	C4b	B4	IV->V	None
UT2A	889	Confined	21	Perennial		N/A	N/A	N/A	
UT2B	34	Unconfined	9	Perennial		N/A	N/A	N/A	
UT3 Reach 1		Confined	15			N/A	N/A	N/A	
UT3 Reach 2	1236	Confined to Unconfined	18	Perennial		E4b	C4b	Ш	
UT4	446	Confined	9	Perennial		N/A	N/A	N/A	
UT5	552	Confined	12	Int.(105 LF) Pernnial		N/A	N/A	N/A	
UT6 Reach 1	FOO	Confined	8	Doronnial		N/A	N/A	N/A	
UT6 Reach 2	588	Continea	10	Pereimidi		A4	A4		

1. The Rosgen classification system (Rosgen, 1994) and Simon Channel Evolution Model (Simon, 1989) is for natural streams. These channels have been heavily manipulated by man and therefore may not fit the classification category or channel evolution as described by these models. Results of the classification and model are provided for illustrative purposes only.



4.0 Functional Uplift Potential

The potential for functional uplift is qualitatively described in this section using terminology from the Stream Functions Pyramid (Harman, 2012). The Stream Functions Pyramid describes a hierarchy of five stream functions, each of which supports the functions above it on the pyramid (and sometimes reinforces those below it). The five functions in order from bottom to top are hydrology, hydraulics, geomorphology, physicochemical, and biology. Neither the Stream Functions Pyramid nor the Quantification Tool are proposed to determine success of the mitigation site.

4.1 Hydrology

The Site is maintained as grazed pasture and woods, and portions of the Site watersheds have been managed for row crops and pasture. These alterations in land cover typically result in reductions in rainfall interception and evapotranspiration which lead to increases in runoff and water yield (Dunne and Leopold, 1978) when compared to forests. The primary result of these changes is an increase in both peak flows and base flows. Increases in water yield usually change over time if vegetation is allowed to regrow, but these watersheds have had relatively consistent land use since 1950.

The Site watersheds has a low percentage of contributing impervious area and low potential for urban growth. Watershed land use directly adjacent to the stream will be shifted from agriculture to forest as part of the project. Additionally, five points with potential to concentrate agricultural input will be treated with BMPs, resulting in a lift to hydrologic function of Site streams after development of the project.

4.2 Hydraulics

Site streams slated for restoration are hydraulically impaired due to lack of consistent floodplain connection, apart from UT2 Reach 2. The streams are affected by incision with bank height ratios ranging from 1.3 to 2.6. Reconnecting the streams to a floodplain using Priority 1 and Priority 2 restoration will provide the in-stream relief needed to improve the hydraulic function of the Site streams. Bankfull and greater flow velocities and channel shear stresses will be reduced. UT2 Reach 2's flow is currently spread into multiple cattle path channels due to intensive cattle activity. Cattle will be excluded from this area, the valley topography will be restored, and UT2 Reach 2 will be reconstructed with depth and plan form appropriate for the restored valley.

4.3 Channel Geomorphology

The past incision and on-going bank erosion related to livestock access place most Site streams slated for restoration in Stages III and IV of the Simon Channel Evolution Model. Approximately 60% of the Site stream banks slated for restoration are actively eroding, and cattle access 100% of those streams. The bedform diversity is moderate, with pool to pool spacing ratio ranging from 1.9 to 11.6, and the streambed is estimated to consist of 50% riffles. Overall, the existing geomorphologic function on these streams ranges from moderate in areas where bedform diversity has formed despite incision and direct cattle access, to very poor in direct cattle wallow areas.

There is opportunity to improve the geomorphologic function on the Site. Incision and bank erosion will be corrected. Active headcuts will be stabilized with step structures. Large woody debris (LWD) will be added to the system through construction of instream structures and bank revetments. A riparian buffer will be planted, resulting in improved long-term geomorphic function of the Site streams.

4.4 Physicochemical

No water quality sampling has been conducted on Site streams and there are no water quality monitoring stations within the watershed; however, the 2009 Upper Yadkin RBRP turbidity as an issue



and has a goal of restoring impaired stream's water quality by limiting sediment, nutrients, and fecal coliform inputs.

All Site streams are accessed by cattle which are a direct source for fecal coliform to the streams. Bank erosion and pasture runoff contributes sediment and nutrients to the streams. As a result of these persistent and on-going threats, there is great potential to improve the physicochemical functioning of the Site streams and their watershed through execution of the project. Beyond the proposed stream activities, BMPs will be installed at four points of concentrated agricultural input to reduce nutrients and sediment which may runoff from the adjacent pastures. A riparian buffer will be established and the pasture within the conservation easement will be taken out of production, thus reducing nutrient-laden runoff and erosion of nutrient-rich bank sediments.

Water will flow over instream structures that will provide aeration. Trees will be planted in the riparian zone to eventually shade and cool stream flow and help reduce and filter runoff. The stream will be reconnected to its floodplain and adjacent riparian wetlands to provide storage and treatment of overbank flows. Streambank erosion will be reduced to nearly eliminate a source of sediment and nutrients. However, the potential improvements to physicochemical functioning on Site streams will not happen immediately and some aspects will not occur until a mature canopy is established. Therefore, physicochemical improvements will not be explicitly monitored for success, although visual observations should show that the improvements are in place and functioning.

4.5 Biology

There are no available biological data for the Site; however, the habitat conditions on the Site vary from poor in areas that are actively incising and heavily accessed by cattle to good in the upper enhancement reaches that exhibit more stable bedforms and are less frequently accessed by cattle. The wooded portions of the riparian buffers provide some permanent habitat, but the pastures in the floodplain of the project provide little habitat value for terrestrial species.

There is opportunity to improve the instream and riparian habitat. Instream structures with a variety of rock and woody materials, pools of varying depths, and woody bank revetments will be added to the Site streams to increase instream habitat diversity, and a wide riparian buffer that will shade the stream and improve terrestrial habitat will be planted. UT2 Reach 2 will be restored to a single thread channel with a diverse bedform. Although the biological response of the project will not be explicitly monitored, improvements in biologic activity of the Site will likely be noted during visual assessments of the project.

4.6 Overall Functional Uplift Potential

Overall, the Site has good functional uplift potential, including slight improvements in watershed hydrology, the improvements in stream hydraulics that will be seen throughout the Site with the stream restoration and BMP installations, and improvements in geomorphology that will come with restoring streams that are suited to the valley types throughout the Site. Physicochemical and biological improvements will result from the project as well.

4.7 Site Constraints to Functional Uplift

There are no known Site constraints that will affect the functional uplift of the project. The valley width on the Site will allow for the development of appropriate pattern and dimensions to restore stable, functioning streams and wetlands. The degree to which the physicochemical and biology functions can improve on the Site is limited by the watershed conditions beyond the project limits, upstream water quality, and the presence of source communities upstream and downstream of the Site.



5.0 Regulatory Considerations

Table 5, below, is a summary of regulatory considerations for the Site. These considerations are expanded upon in Sections 5.1-5.3.

Regulatory Considerations							
Parameters	Applicable?	Resolved?	Supporting Docs?				
Water of the United States - Section 404	Yes	No	PCN ¹				
Water of the United States - Section 401	Yes	No	PCN ¹				
Endangered Species Act	Yes	Yes	Appendix 5				
Historic Preservation Act	Yes	Yes	Appendix 5				
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				

1. PJD submitted to USACE on 5/1/2020 and 6/18/20. See Appendix 2 for email correspondence with USACE. PCN to be provided to NCIRT with Final Mitigation Plan.

5.1 Biological and Cultural Resources

A Categorical Exclusion for the Site was approved on November 2, 2018. This document included investigation into the presence of threatened and endangered species on Site protected under The Endangered Species Act of 1973, as well as any historical resources protected under The National Historic Preservation Act of 1966. The biological conclusion for the Site, per the Categorical Exclusion research and response by US Fish and Wildlife Service, is that "any incidental take that may results from the associated activities [from the project] is exempt under the 4(d) rule." The conclusion for cultural resources per the Categorical Exclusion research and response by the State Historic Preservation Office is that there are no historic resources that would be affected by this project. The signed Categorical Exclusion checklist and summary are provided in Appendix 5. A complete copy of the Categorical Exclusion document, including additional information and regulatory communications, is available upon request.

5.2 FEMA Floodplain Compliance and Hydrologic Trespass

The Site is represented on the Surry County Flood Insurance Rate Map Panel 5927, with an effective date of August 18, 2009. The entire Site is outside of a Special Flood Hazard Area (SFHA) regulatory floodplain. Surry County does not require a floodplain development permit for projects outside of the SFHA.

The proposed design associated with the Site has limited or no risk of potential hydrologic trespass since the project encompasses predominantly steep, zero order or first order streams. Venable Creek and UT1 are the only streams with risk for backwater effects. Venable Creek Reach 1 is enhancement II with no instream work proposed, and the first 200 feet of Reach 2 is enhancement I at grade, reducing the risk of offsite backwater effects. UT1 is a Priority 2 restoration for its length, which increases floodplain capacity with limited backwater potential.

5.3 401/404

Some wetlands within the floodplain adjacent to the existing streams will be partially impacted during realignment of the stream channel. Wetlands on the Site that are within the conservation easement and outside of the limits of disturbance will be flagged with safety fence during construction to prevent unintended impacts. This will be denoted in the final construction plans. The Pre-Construction Notification, including this data, will be submitted to the NCIRT with the Final Mitigation Plan.



6.0 Mitigation Site Goals and Objectives

The major goals of the proposed stream mitigation project are to provide ecological and water quality enhancements to the Yadkin River Basin while creating a functional riparian corridor at the site level. Project goals are desired project outcomes and are verifiable through measurement and/or visual assessment. Objectives are activities that will result in the accomplishment of goals. The project will be monitored after construction to evaluate performance as described in Sections 8 and 9 of this report. The project goals and related objectives are described in Table 6.

Goal	Objective	CU-Wide and RBRP Objectives Supported	Function Supported
Exclude livestock from stream channels.	Install livestock fencing on all or portions of the Site and/or permanently remove livestock from all or portions of the Site to exclude livestock from stream channels and riparian areas.	Reduce nutrient, sediment, and fecal coliform inputs; Protect restored aquatic habitat; Implement agricultural BMPs (permanent livestock exclusion).	Hydraulic, Geomorphology, Physicochemical, Biology
Improve the stability of stream channels.	Reconstruct stream channels slated for restoration with stable dimensions and appropriate depth relative to the existing floodplain. Add bank revetments and in- stream structures to protect restored/ enhanced streams.	Reduce sediment and nutrient inputs; restore aquatic habitat.	Hydraulic, Geomorphology, Physicochemical, Biology
Improve instream habitat.	Install habitat features such as constructed steps, cover logs, and brush toes on restored reaches. Add woody materials to channel beds. Construct pools of varying depth.	Restore degraded aquatic habitat.	Geomorphology, Biology
Restore and enhance native floodplain vegetation.	Convert active cattle pasture to forested riparian buffers along all Site streams, which will slow and treat runoff from adjacent pasture before entering streams. Protect and enhance existing forested riparian buffers. Treat invasive species.	Reduce nutrient, sediment, and fecal coliform inputs.	Hydrology, Hydraulic, Geomorphology, Physicochemical, Biology
Treat concentrated agricultural runoff	Install agricultural BMPs in areas of concentrated agricultural runoff to treat runoff before it enters the stream channel.	Reduce nutrient, sediment, and fecal coliform inputs.	Hydrology, Hydraulic, Geomorphology, Physicochemical, Biology
Permanently protect the project site from harmful uses.	Establish a conservation easement on the Site. Exclude livestock from Site streams.	Protect aquatic habitat; Protect water supply waters; Reduce nutrient, sediment, and fecal coliform inputs; Implement agricultural BMPs (permanent livestock exclusion).	Hydrology (local), Hydraulic, Geomorphology, Physicochemical, Biology

Table 6: Mitigation Goals and Objectives



7.0 Design Approach and Mitigation Work Plan

7.1 Design Approach Overview

The design approach for this Site was developed to meet the goals and objectives described in Section 6 which were formulated based on the potential for uplift described in Section 4. The design is also intended to provide the expected outcomes in Section 6, though these are not tied to performance criteria. The project streams proposed for restoration on the Site will be reconnected with an active floodplain and the channels will be reconstructed with stable dimension, pattern, and profile that will transport the water and sediment delivered to the system. Cattle will be excluded from the riparian zone and the entire project area will be protected in perpetuity by a conservation easement.

The design approach for this Site utilized a combination of analog and analytical approaches for stream restoration, and also relies on empirical data and prior experiences and observations. Reference reaches were identified to serve as the basis for design parameters. Channels were sized based on design discharge hydrologic analysis which uses a combination of empirical and analytical data as described within this report. Designs were then verified and/or modified based on sediment transport analysis. These design approaches have been used on many successful Mountain and Piedmont restoration projects and is appropriate for the goals and objectives for this Site.

7.2 Reference Streams

Reference streams provide geomorphic parameters of a stable system, which can be used to inform design of stable channels of similar stream types in similar landscapes and watersheds. Eight reference reaches were identified for this Site and used to support the design of streams (Figure 6). These reference reaches were chosen because of their similarities to the Site streams including drainage area, valley slope, morphology, and bed material. Due to the variety of slopes and project stream types present on the Site, the distribution of reference reaches is wide, throughout North Carolina's foothills and western Piedmont. Geomorphic parameters for these reference reaches are summarized in Appendix 4. The references to be used for the specific streams are shown in Table 7. A description of each reference reach is included below.

	Venable Creek		1174	UT2	UT3	UT6	
	Reach	2	3	011	2	2	2
Reference Stream	Stream Type	B4	C4	C4b	B4	C4b	A4
Ironwood Tributary	A5a+						х
Timber Tributary	B4			х	х	х	
UT to South Fork Fishing Creek	B5a						х
Riverbend Park	C4		х	х		х	
UT to Gap Branch	B4a/A4						х
Agony Acres UT1 Reach 3	B4	х			х		
UT to Rocky Creek	E4b	х	х	х		х	
Box Creek	C4		х				

Table	7: Stream	Reference	Data I	Jsed in	Development	of Design	Parameters
Table	7. Stream	Reference	Data	JSEU III	Development	OI Design	rarameters

7.2.1 Critcher Brothers Reference Streams

The following streams are in Wilkes County at Wildlands' Critcher Brothers Mitigation Site. The landscape of this project is similar to the Site and supports a variety of stream types from B streams to high sloped Aa+ step pool channels.



Ironwood Tributary Reference Reach

Ironwood Tributary reference reach is geomorphically described as a steep (11.4%) step-like system and classifies as an A5a+ channel. It has a drainage area of 0.03 square miles and is surrounded by heavy canopy coverage. It has a channel sinuosity of 1.19 which is considerably high for high gradient systems. Several long gravel/cobble riffles were observed that cascaded into pools over root mass, woody debris, or a boulder step at the tail of riffle.

Timber Tributary Reference Reach

Timber Tributary Reference Reach is a 200 ft B4 channel with a drainage area of approximately 0.04 square miles. The stream meanders through a confined valley surrounded by mature trees. The channel has a moderate slope of 3.2%, and a channel sinuosity of 1.12. This system supports varied habitats including woody debris, rock riffles and meander pools.

UT to SF Fishing Creek Reference Reach

UT to SF Fishing Creek reference reach is a small, steep (8.2%) B5a channel. It has a drainage area of approximately 0.02 square miles. UT to SF Fishing Creek is surrounded by a forested land cover and is located at the downstream-most end of the project site. The bedform consists of bedrock slides and boulder step-pool cascades located at the tail of riffle features. The channel is confined so the banks are relatively high but host a variety of mature vegetation.

7.2.2 Riverbend Park

Riverbend Park is located in Catawba County, NC and receives drainage from a predominantly forested watershed. The surveyed portion of the reach has a slope of 1.3% with a moderate sinuosity and quality bedform. This reach has a drainage area of 0.1 square miles and is classified as a Rosgen C4 stream. The reach had an entrenchment ratio of 1.6, width to depth ratio of 11.8, and a bank height ratio of 1.2.

7.2.3 UT to Gap Branch

UT to Gap Branch is located in the Box Creek Wilderness near Union Mills, NC. This stream flows through a confined valley with an alluvial bottom. The overall stream slope is 6.8% and the width to depth ratio is 10.1. The entrenchment ratio is 3.4, and the reach classifies as a slightly entrenched B4a.

7.2.4 Agony Acres UT1 Reach 3

Reach 3 of UT1 on the Agony Acres Mitigation Site in Guilford County was selected as a reference reach due to its similarity in slope and drainage area to the restoration reaches on the project. UT1 – Reach 3 has a drainage area of 0.3 square miles and classified as an B4 stream type.

7.2.5 UT to Rocky Creek

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

7.2.6 Box Creek

The Box Creek reference reach site is in Rutherford County and has a drainage area of 2.13 square miles. The entire watershed is forested and the reference reach site is located approximately a quarter mile upstream from a large pond. The reach is characterized by short riffles, deep pools, and long shallow runs. This moderately sinuous reach (1.3) classifies as a C4 channel and has a high width/depth ratio of 19.1. This reach reported a bank height ratio of 1.5 but banks were typically stable due to a large extent of woody vegetation lining each bank, especially along the outer bends of a few tight meanders. In-



stream habitat structures included undercut banks, woody debris, and coarse substrate from which fish have built several gravel piles for nesting.

7.3 Design Discharge Analysis

Multiple methods were used to develop bankfull discharge estimates for each of the project restoration reaches. These are discussed below. Figure 7 shows the relationship of the data to the design discharge estimates.

7.3.1 Regional Curve Data

Discharge was estimated using the published NC Mountain Curve (Figure 7) as well as the updated curve for rural Piedmont and Mountain streams, shown as the Alan Walker Curve.

7.3.2 Regional Flood Frequency Analysis

A regional flood frequency analysis was performed by using 26 USGS gages in the North Carolina Piedmont including five gages with drainage areas smaller than 1 square mile. The Hosking and Walls (1995) homogeneity test was performed using statistical software R[®] to identify the most appropriate gages for use in the analysis. Flood frequency regression curves were developed to calculate discharges for ungaged streams in the North Carolina Piedmont for the 1.2-year and 1.5-year recurrence intervals.

7.3.3 Site Specific Reference Reach Curve

Eight reference reaches were identified for this project. Each reference reach was surveyed to develop information for analyzing drainage area-discharge relationships as well as development of design parameters. Stable cross-sectional dimensions and channel slopes were used to compute a bankfull discharge with the Manning's equation for each reference reach. The resulting discharge values were plotted with drainage area on Figure 7 (Reference Reach Curve) and compared the other discharge estimation methods.

7.3.4 Maximum Discharge (Manning's Equation)

A riffle cross-section was surveyed on each design reach on the Site. Due to the existing impairments throughout Site streams, bankfull indicators were weak and not considered reliable for estimating a bankfull discharge. Instead, Manning's equation was used to calculate a discharge associated with the top of banks for all project streams. Stream slope was calculated from the surveyed channel slope, and roughness was estimated using guidelines from Chow (1959). This corresponding discharge was plotted on Figure 7 (Qmax – Existing Site Streams) and considered as an upper limit for potential bankfull discharge values throughout the Site except for UT2 Reach 2. UT2 Reach 2's flow is split due to cattle trampling and the bankfull cross section surveyed only carrys a portion of the watershed flow.

7.3.5 Wildlands Regional USGS Rural Calculator

Wildlands developed a regional flood frequency analysis tool that tailored the USGS 2009 publication *Magnitude and Frequency of Rural Floods in the Southeastern United States, through 2006* to the Piedmont of North Carolina. Of the 103 stations referenced in the publication, 23 were used in the development of the tool. To fill gaps in data, five additional stations were added by Wildlands to represent streams with drainage areas less than one square mile. The Hosking and Wallis homogeneity test was performed in R[©] to identify the most appropriate gages based on homogeneity (Hosking and Wallis, 1993). The gages used were:



- USGS 02096740 Gun Branch near Alamance, NC (DA = 4.06 mi²)
- USGS 02096846 Cane Creek near Yadkin Grove, NC (DA = 7.54 mi²)
- USGS 02097010 Robeson Creek near Pittsboro, NC (DA = 1.71 mi²)
- USGS 02101030 Falls Creek near Bennett, NC (DA = 3.43 mi²)
- USGS 0210166029 Rocky River at SR1300 near Crutchfield Crossroads, NC (DA = 7.42 mi²)

The data from these 28 gage stations were used to develop flood frequency curves for the 1.2-year and 1.5-year recurrence interval discharges. These relationships can be used to estimate discharge of those recurrence intervals for ungaged streams in the same hydrologic region and were solved for each project reach's discharge with the drainage area as the input. The discharge estimates are shown on Figure 7 as the Regional Flood Frequency storms.

7.3.6 Design Discharge Analysis Summary

The design discharge analysis began with a review of the Site streams' maximum discharges. These points were outside the scatter of all other curves and datasets for all streams except UT2 Reach 2 and were thus removed from consideration due to the unstable nature of the cross-sections. UT2 Reach 2's existing cross section does not receive all of the watershed flow due to multiple flowpaths through cattle trampled areas, so the maximum discharge is low. Review of the regional curve, the reference reach curve, and the 1.2-year and 1.5-year flood frequency relationships revealed that the NC Mountain Curve slope and intercept are similar to that of the reference reach curve, while the Alan Walker Curve intercept is similar to the 1.2-year predictions. These curves were then used to set the upper and lower boundaries, respectively, for the selected Site design discharges. Design discharges for were selected within the scatter of the reference reach curve and between the 1.2-year and 1.5-year predictions for all streams except UT2 Reach 2. UT2 Reach 2 exists a steep valley and flows through a wetland developed within the alluvial fan sediments. UT2 Reach 2's design discharge was intentionally set lower, in line with the 1.2-year prediction, to promote frequent stream-floodplain interaction and further development of the stream-wetland complex.

The design discharge selections support the design goal of reducing instream stress by promoting frequent dispersal and infiltration of flood flows onto floodplains while maintaining small channel constructability. Table 8 gives a summary of the discharge analysis, while Figure 7 illustrates the design discharge data.

		Venable Creek		1171	UT2	UT3	UT6
		Reach 2	Reach 3	011	Reach 2	Reach 2	Reach 2
DA (acres)		519	599	334	43	18	10
DA (sq. mi.)		0.81	0.94	0.52	0.07	0.03	0.02
NC Mountain Regional Curve (cfs)		86	98	61	13	7	4
Alan Walker Curve (cfs)		47	54	33	7	3	2
Wildlands Regional USGS Flood Frequency Analysis (cfs)	1.2-year	67	76	48	11	6	4
	1.5-year	95	107	69	16	8	5
Site Specific Reference Reach Curve		69	75	55	19	12	9
Max Q from Manning's Eq. from XS survey (cfs)		247	256	125	4	51	79
Final Design Q (cfs)		75	83	52	10	6	4

Table 8: Summary of Design Discharge Analysis for Restoration Reaches



7.4 Design Channel Morphological Parameters

Reference reaches were a primary source of information to develop the pattern and profile design parameters for the streams. Ranges of pattern parameters were developed within the reference reach parameter ranges with some exceptions based on best professional judgement and knowledge from previous projects. For example, for meandering C designs, radius of curvature ratio is kept above 1.8 on all reaches and meander width ratio is kept above a 2.4. Meandering designs have pool widths to be 1.2 to 1.5 times the width of riffles to provide adequate point bars and riffle pool transition zones. Wildlands has found these minimum ratios to support stable geometry. Designer experience was used for pool design as well. Pool depths were designed to be a minimum of 3 times deeper than riffles to provide habitat variation. Cross-section parameters such as area, depth, and width were designed based on the design discharge and stable bank slopes. In some cases, the width to depth ratio was increased beyond reference parameters as dictated by prior project experience to provide stable bank slopes prior to the development of a fully vegetated streambank. Key morphological parameters for the Site are listed in Tables 9-12. Complete morphological tables for existing, reference, and proposed conditions are in Appendix 4.

	Venable Creek Reach 2					Venable Creek Reach 3				
Parameter		Refer	ences	Proposed	Existing	References				
	Existing	Agony Acres UT1 Reach 3	UT to Rocky Creek			Riverbend Park	UT to Rocky Creek	Box Creek	Proposed	
Contributing Drainage Area (acres)	519	96	672	519	599	166	672	1363	599	
Channel/Reach Classification	E4	B4	E4b	B4	E/C4	C4	E4b	C4	C4	
Design Discharge Width (ft)	10.6	11.1	12.2	15.0	10.5 – 10.8	10.6	12.2	23.5	15.6	
Design Discharge Depth (ft)	1.5	0.7	1.3	1.1	1.6- 1.7	0.9	1.3	1.2	1.1	
Design Discharge Area (ft ²)	15.6	7.4	16.3	16.4	16.9- 18.1	9.5	16.3	28.9	17.3	
Design Discharge Velocity (ft/s)	4.8	4.9	5.5	4.6	4.9	3.5	5.5	3.3	4.8	
Design Discharge (cfs)	75	37	85	75	83	33	85	95	83	
Water Surface Slope (ft/ft)	0.0190	0.0490	0.0200	0.0230	0.0136	0.0130	0.02	0.0084	0.0140	
Sinuosity	1.08	1.04	1.10	1.08	1.14	-	1.10	1.33	1.29	
Width/Depth Ratio	7.2	16.6	9.1	13.8	6.1- 6.9	11.8	9.1	19.1	14.1	
Bank Height Ratio	1.6	1.0	1.0	1.0-1.1	1.3- 1.6	1.2	1.0	1.5	1.0-1.1	
Entrenchment Ratio	4.3	2.3	6.0	2.0+	8.6- 10.5	1.6	6.0	3.3	2.2+	
Reachwide d50 (mm)	40.6	50.6	22.6	-	13.3	-	22.6	-	-	

Table 9: Summary of Morphological Parameters for Venable Creek



	Existing			Proposed			
Parameter	UT1	UT3 Reach 2	Timber Tributary	Riverbend Park	UT to Rocky Creek	UT1	UT3 Reach 2
Contributing Drainage Area (acres)	334	18	26	166	672	334	18
Channel/Reach Classification	E4b	E4b	B4	C4	E4b	C4b	B4
Design Discharge Width (ft)	8.7	4.2	8.9	10.6	12.2	11.5	4.9
Design Discharge Depth (ft)	1.1	0.9	0.5	0.9	1.3	0.97	0.4
Design Discharge Area (ft ²)	9.8	3.8	4.6	9.5	16.3	11.1	1.9
Design Discharge Velocity (ft/s)	5.3	1.6	3.7	3.5	5.5	4.7	3.1
Design Discharge (cfs)	52	6	17	33	85	52	6
Water Surface Slope (ft/ft)	0.0212	0.0369	0.0334	0.0130	0.0200	0.0210	0.0340
Sinuosity	1.04	1.47	1.12	-	1.10	1.14	1.02
Width/Depth Ratio	7.6	4.7	17.0	11.8	9.1	11.8	12.3
Bank Height Ratio	1.4	1.5	1.0	1.2	1.0	1.0-1.1	1.0-1.1
Entrenchment Ratio	7.9	6.4	1.5	1.6	6.0	2.2+	2.0+
Reachwide d50 (mm)	9.5	3.1	6.5	-	22.6	9.5	3.1

Table 10: Summary of Morphological Parameters for UT1 and UT3

Table 11: Summary of Morphological Parameters for UT2

	Existing	Refer	ences	Proposed
Parameter	UT2 Reach 2	Timber Tributary	Agony Acres UT1 Reach 3	UT2 Reach 2
Contributing Drainage Area (acres)	43	26	96	43
Channel/Reach Classification	C4b	B4	B4	B4
Design Discharge Width (ft)	4.0	8.9	11.1	5.6
Design Discharge Depth (ft)	0.3	0.5	0.7	0.5
Design Discharge Area (ft ²)	1.2	4.6	7.4	2.6
Design Discharge Velocity (ft/s)	8.1	3.7	4.9	3.9
Design Discharge (cfs)	10	17	37	10
Water Surface Slope (ft/ft)	0.0352	0.0334	0.0490	0.0380
Sinuosity	1.18	1.12	1.04	1.02
Width/Depth Ratio	12.7	17	16.6	12.1
Bank Height Ratio	1.0	1	1.0	1.0-1.1
Entrenchment Ratio	2.7	1.5	2.3	2.0+
Reachwide d50 (mm)	24.1	6.5	50.6	24.1



	Existing		References		Proposed
Parameter	UT6 Reach 2	lronwood Tributary	UT to South Fork Fishing Creek	UT to Gap Branch	UT6 Reach 2
Contributing Drainage Area (acres)	10	19	13	26	10
Channel/Reach Classification	A4	A5a+	B5a	B4a/A4	A4
Design Discharge Width (ft)	2.1	5.0	4.1	6.2	3.7
Design Discharge Depth (ft)	0.8	0.6	0.4	0.6	0.3
Design Discharge Area (ft ²)	1.6	2.7	1.8	3.8	1.2
Design Discharge Velocity (ft/s)	2.5	4.9	4.1	5.0	3.3
Design Discharge (cfs)	4	13	8	18.7	4
Water Surface Slope (ft/ft)	0.0870	0.1139	0.0815	0.0680	0.0822
Sinuosity	1.01	1.19	-	-	1.00
Width/Depth Ratio	2.7	9.1	9.3	10.1	11.2
Bank Height Ratio	2.6	1.3	1.0	1.0	1.0-1.1
Entrenchment Ratio	3.7	2.1	1.7	3.4	1.4+
Reachwide d50 (mm)	8.5	0.9	1.2	19.0	8.5

 Table 12: Summary of Morphological Parameters for UT2

7.5 Sediment Transport Analysis

As discussed in Section 4.1, the UT1 and Venable Creek watersheds deliver some sediment to the onsite streams, but the majority of sediment observed in the project streams originates through onsite erosion and cattle access. The project stream and valley restoration will address the major sediment sources within the watershed by protecting stream banks, removing cattle from the system, and reducing channel shear stress. Buffers will be converted from pastures to planted native woody tree and shrub species. The restored buffer will provide filtration for overland flow from remaining upland agricultural fields. Additionally, four BMPs will be constructed to treat points of concentrated agricultural runoff. The existing Site streams are not capacity limited, and the project should reduce sediment supply; therefore, the focus of sediment transport analysis for design was to verify that the designed channels will be stable over time and have the competence to pass the sediment that continues to be delivered by the watershed.

7.5.1 Competence Analysis

Competence analyses were performed during design for each of the restoration reaches by comparing shear stress associated with the design bankfull discharge, proposed channel dimensions, and proposed channel slopes with the size distribution of the existing bed load. The analysis utilized standard equations based on a methodology using the Shields (1936) curve and Andrews (1984) equation described by Rosgen (2001). Channel slope and design dimensions were varied as possible until the resulting design verified that the stream reach could move the bed load supplied to the stream. Each stream reach design follows the natural fall of the valley, and design stream slopes can vary widely over a design reach. For this reason, the lowest design slope was used in the competence analysis to ensure that the sediment delivered by the watershed would pass through the lowest sloped reach. The results of the analysis are shown in Table 13.



	Venabl	e Creek	1111	UT2	UT3	UT6
	Reach 2	Reach 3	011	Reach 2	Reach 2	Reach 2
Dbkf (ft)	1.09	1.11	0.97	0.46	0.40	0.33
Minumum Schan (ft/ft)	0.0230	0.0070	0.0210	0.0320	0.0260	0.0820
Bankfull Shear Stress, t (lb/sq ft)	1.51	0.47	1.21	0.89	0.62	1.63
Dmax Bar/Subpavement (mm)	170	78	64	93	56	52
Dcrit (ft)	1.2	1.1	0.24	0.24	0.16	0.05
Scrit (ft/ft)	0.0171	0.0069	0.0051	0.01638	0.0105	0.0114
Movable particle size (mm) Shield's/Rosgen	120/206	36/87	95/175	69/139	47/107	130/218
Predicted Shear Stress to move Dmax Shield's/Rosgen	2.11/1.16	1.00/0.40	0.83/0.31	1.18/0.51	0.73/0.26	0.68/0.23

Table 13: Results of Competence Analysis

The initial competence analysis was based on the size material naturally found in the stream to mimic potential bed load. The results were used to inform further design of the reach. Due to the steeper nature of UT1, UT2, UT3, and UT6, the streams are often capable of moving particle sizes far greater than that supplied by the watershed. By reviewing competence using the lowest design slope, often where the stream enters the Venable Creek floodplain, the design was iterated to have enough slope so as to continue to move sediment through the system without excessive aggradation. On Venable Creek, the Andrew's equation for gravel bed transport suggests that the design is close to equilibrium with the watershed sediment supply. The Shield's equation suggests that the stream design may not be competent to pass the largest particle supplied by the watershed, while Rosgen's equation suggests that it is competent to move the watershed supply. Shield's equation was based on data collected from homogenous size distributions in flumes while Rosgen's equation was based on data collected from heterogenous size distribution in natural streams. Rosgen's data set is more similar to the Site streams and suggests that the Venable Creek design is more than competent to pass the sediment generated from the watershed.

The excess shear throughout most of the Site streams influenced the design of rock and wood step structures to provide grade control and increase roughness within the channel. Riffles with larger materials, such as chunky riffles, were also integrated into the design as grade control. The proposed D_{50} and D_{100} for the constructed riffles on all stream reaches will be sized so that the reconstructed channels will not produce enough shear stress to entrain the largest particles in these structures. This will ensure a stable pavement while allowing for bed load material to be active within the system.



7.6 Project Implementation

Currently, the streams throughout the Site are extensively impacted by grazing. The primary stressors to Site streams are livestock trampling and fecal coliform inputs, lack of stabilizing stream bank and riparian vegetation, active erosion, and incision.



Wildlands' approach to improving the streams on the Site includes a multi-tiered approach including enhancement I and II, and Priority 1 restoration with Priority 2 restoration limited to confluences and transition zones. The efforts will extend up to the stream origin on UT2, UT3, UT4, and UT6, and far into the headwaters of UT2A and UT5, representing a holistic, watershed scale restoration of much of the Site.

Venable Creek Reaches 1 and 4, UT2 Reach 1, UT2A, UT3 Reach 1, UT4, UT5, and UT6 Reach 1 are relatively stable geomorphically, but historic and ongoing cattle access to the streams has resulted in areas of trampled stream banks, erosion, and spot areas of poor riparian buffers. These reaches are slated for enhancement level II, which will include correcting isolated areas of bank erosion on perennial reaches.

Enhancement I is proposed for Venable Creek Reach 2. The profile will be adjusted within the existing stream banks, and areas of bank erosion will be corrected. This reach serves as a transition between the enhancement II length of Venable Creek Reach 1 to full restoration proposed on Venable Creek Reach 3.

Restoration practices are proposed on the remainder of the Site where persistent, systemic incision and erosion cannot be addressed through spot treatment. Enhancement I efforts on Venable Creek Reach 2 allow for Venable Creek Reach 3 to connect directly to the historic floodplain using Priority 1 restoration with a short, transitional length of Priority 2 restoration. Priority 1 restoration will continue to the downstream reach extents, where a transitional length of Priority 2 restoration will be required to tie the stream into the existing channel. UT2B will be garded to tie into the new location of Venable Creek Reach 3.

UT1 will also be brought up to the historic floodplain beginning at the Siloam Road culvert, allowing for an immediate transition to Priority 1 restoration. A short length of Priority 2 restoration ties UT1 into Venable Creek Reach 2.

Restoration of UT2 Reach 2 begins at the confluence of UT2 and UT2A. As the valley widens, a critical farm road along the left valley toe pinches the floodplain. This farm road will remain just outside of the easement. To compensate for this pinch point, the right valley wall will be graded to widen UT2's floodplain. Cattle trampling through this valley will be corrected and UT2 Reach 2 will be restored to a


single thread channel. UT2 Reach 2 will drop into Venable Creek over a structure, eliminating the need for a transitional section of Priority 2 restoration.

UT3 Reach 2 will be brought up onto the historic floodplain beginning at a bedrock knickpoint, allowing for immediate transition to Priority 1 restoration. Priority 1 restoration will continue downstream to UT3 Reach 2's confluence with Venable Creek.

UT6 Reach 2 will be routed back to its original valley. Valley walls will be graded to stable slopes and stable step-pool bedform will be constructed.

Along each restoration and enhancement reach, cattle will be excluded and open areas of the buffer will be planted.

This proposed work will not only improve Site streams, but will restore the habitat fragmentation caused by the current agricultural land use practices. Restoration of riparian buffers will connect the entire watershed to the existing forested areas upstream of UT2 and UT5 and downstream on Venable Creek to provide an uninterrupted riparian corridor. A concept plan for the Site is provided in Figure 8.

7.7 Onsite Best Management Practices

Eroding, ephemeral features and actively grazed cattle pasture upstream of the origination of UT3, UT4, and UT6 concentrate the pasture drainage to the stream channels. Cattle wallow areas adjacent to Venable Creek are discrete sources for sediment and fecal matter. Stormwater BMPs will be established upstream of jurisdictional features within the conservation easement to capture and treat the runoff from these areas. The BMPs will be planted with appropriate native species to encourage nutrient uptake, settling, and treatment. BMPs are expected to capture sediment after construction and fill in over time, transitioning to a vegetative filter feature. BMPs will not be monitored or maintained.



7.8 Vegetation and Planting Plan

Non-forested areas within the conservation easement will be planted, which includes additional buffer areas beyond the minimum requirement of 30 feet from top of bank. Riparian buffers will be planted with native vegetation chosen to develop a forested riparian zone. The Dry-Mesic Oak-Hickory and Basic Mesic Forest community types were used as references for creating the site planting plan. Many of the selected species are representative of these community types although a few additional early successional species were included to help climax species establish. Species chosen for the planting plan are listed on Sheet 3.0 of the Draft Plans located in Appendix 12.

The riparian buffer and wetland areas will be planted with bare root seedlings. In addition, the stream banks will be planted with live stakes and the channel toe will be planted with herbaceous species. Permanent herbaceous seed will be spread on streambanks, floodplain areas, and disturbed areas within the project easement. Bare root and live stake planting will take place during the dormant season.

Some of the existing invasive species along restoration and enhancement reaches, including fescue (*Festuca* spp.), will be treated with herbicide preconstruction, while invasives within active construction corridors will be mechanically removed during construction. The extent of invasive species coverage will be monitored, mapped, and controlled as necessary throughout the required monitoring period as discussed in Appendix 7.



7.9 Utilities, Stream Crossings, and Site Access

Table 14 summarizes the proposed crossings on the Site. All crossings are included in the easement and are existing utility or stream crossings. Ford or culvert crossings will be fenced with 5-strand barbed wire or charged high-tensile wire and gated. The culvert pipes will be buried 6 to 12 inches to allow for a natural stream bed through the crossing, promoting fish passage and aquatic habitat continuity. The maintenance of the crossings will be the responsibility of the landowner once the project is closed by the NCIRT and transferred to NCDEQ stewardship.

There are two overhead utility easements which overlap the project easement; one on Venable Creek shown in Table 14 and one at the upstream end of UT6. UT6 originates within the utility easement. The conservation easement extends to UT6's origin but no credit is proposed within the utility easement.

The landowner plans to install cattle watering systems post-project at several locations as part of the project implementation. The easement area can be accessed for construction, monitoring, and long-term stewardship from Little Mountain Church Road and Siloam Road.

Reach	Crossing Location (STA)	Crossing Type	Within Conservation Easement?
Venable Creek	107+00	Utility only/no stream bed	Voc
Vehable Creek	102+33	crossing or livestock access	165
		Gated and fenced ford –	
Venable Creek	132+75	livestock access only during	Yes
		coordinated crossing events	
1172	208.72	Fenced culvert – no	Vec
012	508+72	livestock access to stream	res

Table 14: Crossings Summary

7.10 Project Risk and Uncertainties

In general, this project is low risk. There is low risk of hydraulic trespass from the project due to the current and designed slopes of the project channels. The farmers are on the land daily and will be able to repair damaged fences and/or remove stray livestock from the easement quickly.

The rural agricultural zoning of the watershed protects it from potential urban development, however there is always risk of logging on large tracts of forested land such as those within the Venable Creek and UT1 watersheds. Logging of these watersheds could increase peak flows and sediment to these streams. UT1's watershed contains several impoundments which may function to control fine sediment runoff and peak flows should logging occur.

Valley slope transitions, such as where the Site tributaries enter the broad Venable Creek floodplain, can naturally function as aggradational areas. Sediment transport has been analyzed for restoration reaches through valley transitions and the streams are expected to be competent to move the existing bedload over time. Existing fine sediment sources, including streambank erosion and farm runoff, will be reduced through stream bank repair and BMP installation, reducing the risk of aggradation due to capacity. If unforeseen land use changes increase fine sediment loads beyond current levels, there is a risk of aggradation at the valley slope breaks. This risk may be offset by additional vegetation on floodplains or off-line sediment sink BMPs.

There is potential for utility line maintenance where the lines cross the easement on Venable Creek and overlaps a portion of the easement at the upstream extents of UT6. No poles are located within the conservation easement, so anticipated impacts are limited to vegetation maintenance, and these areas were excluded from mitigation creidting. There is also future potential for the culverts under Little Mountain Church Road and Siloam Road to be maintained in the future. The conservation easement



does not overlap the road right-of-ways. If maintenance impacted the conservation easement, it is anticipated to be limited to the area immediately in the vicinity of the culverts.

8.0 Performance Standards

The stream performance standards for the project have been developed based on guidance presented in the DMS Stream and Wetland Mitigation Plan Template and Guidance (June 2017) and the October 2016 NCIRT Mitigation Monitoring Guidance. Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. Specific performance standard components are proposed for stream morphology, stream hydrology, and riparian vegetation. Performance criteria will be evaluated throughout the seven-year post-construction monitoring period. An outline of the performance criteria components follows.

8.1 Stream Morphological Parameters and Channel Stability

8.1.1 Dimension

Riffle cross sections on the restoration reaches should be stable and should show little change in bankfull area, bank height ratio, and width-to-depth ratio. Per NCIRT guidance (2016), bank height ratios shall not exceed 1.2 and entrenchment ratios shall be at least 1.4 for restored B channels and 2.2 for restored C channels to be considered stable. Riffle cross sections should fall within the parameters defined for channels of the appropriate stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Changes in the channel that indicate a movement toward stability or enhanced habitat include a decrease in the width-to-depth ratio in meandering channels or an increase in pool depth. Remedial action would not be taken if channel changes indicate a movement toward stability.

8.1.2 Pattern and Profile

Visual assessments and photo documentation should indicate that streams are remaining stable and do not indicate a trend toward vertical or lateral instability. Signs of instability may include bank scour, bank migration, and bed incision. Additionally, UT2 Reach 2 shall be visually assessed annually to determine if the stream is maintaining single-thread form.

8.1.3 Substrate

Restoration reaches should show a progression towards or the maintenance of coarser materials in the riffle features and smaller particles in the pool features. However, natural variations in pool and riffle substrate is expected as a result of sediment transport processes in steeper sloped channels. A reach-wide pebble count will be performed in each restoration reach each monitoring year for classification purposes. A wetted pebble count will be performed during the baseline survey at surveyed riffles to characterize the pavement. Riffles may fine over the course of monitoring due to the stabilization of contributing watershed sediment sources.

8.2 Hydrology

Stream hydrologic monitoring will be conducted on stream reaches that utilize restoration and/or enhancement level I approaches where in-stream work conducted alters channel dimensions below the bankfull elevation. Automated pressure transducers will be used to bankfull events and are referred to as crest gages (CG) in text and tables.

The occurrence of bankfull events will be documented throughout the monitoring period. Four bankfull flow events, occurring in separate years, must be documented within the seven-year monitoring period.

Automated crest gages will be set to record bankfull events every three hours and will be installed within the stream's surveyed riffle cross section. The device will be checked quarterly to determine if a



bankfull event has occurred. Evidence of bankfull events, such as the occurrence of debris lines and sediment deposition, will be documented with photos when possible.

8.3 Vegetation

The final vegetative performance standard will be the survival of 210 planted stems per acre in the planted riparian and wetland areas at the end of the required seven-year monitoring period. The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of monitoring year three (MY3) and at least 260 stems per acre at the end of MY5. Also, trees must average six feet in height at the end of the fifth monitoring year, and eight feet in height at the end of the seventh monitoring year. The extent of invasive species coverage will be monitored and controlled as necessary throughout the required monitoring period.

Vegetation monitoring quadrants will be installed across the Site to measure the survival of the planted trees with the riparian and wetland areas. The number of monitoring quadrants required, and frequency of monitoring will be based on the DMS monitoring guidance documents. Vegetation monitoring will occur between July 1 and leaf drop and will follow the CVS-EEP Protocol for Recording Vegetation (2008) or another DMS approved protocol.

8.4 Other Parameters

8.4.1 Photo Documentation

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

8.4.2 Visual Assessments

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

9.0 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. Annual monitoring data will be reported using the DMS Annual Monitoring Reporting Template (June 2017). 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.

Using the DMS Baseline Monitoring Report Template (June 2017), a baseline monitoring document and as-built record drawings of the project will be developed following the planting completion and monitoring installation on the restored site. Monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS by November 30. Complete monitoring reports will be prepared in the fall of monitoring year one, two, three, five, and seven and submitted to DMS. In monitoring years four and six, a brief summary of the site conditions along with photos, current condition plan view (CCPV) map, and applicable hydrology data will be prepared and submitted to DMS. The closeout monitoring period will extend seven years beyond completion of construction or until performance standards have been met. The closeout report will follow the DMS Closeout Report Template Version 2.2 (January 2016).

Table 15, below, describes how the monitoring plan is set up to verify that project goals and objectives have been achieved.



Table 15: Monitoring Plan

Goal	Objective	Performance Standards	Monitoring Metric
Exclude livestock from stream channels and wetlands.	Install livestock fencing on all or portions of the Site and/or permanently remove livestock from all or portions of the Site to exclude livestock from stream channels and riparian areas.	Fence conservation easement to exclude livestock or remove livestock from adjacent land. Install fenced and gated crossings as needed.	Visual assessment.
Improve the stability of stream channels.	Reconstruct stream channels slated for restoration with stable dimensions and appropriate depth relative to the existing floodplain. Add bank revetments and in-stream structures to protect restored/ enhanced streams.	Stream pattern and profile must remain stable. Bank height ratios stay below 1.2. Visual assessments showing progression towards stability. Reachwide pebble count shows riffles are coarser than pools.	Cross-section monitoring, visual assessment, reachwide pebble counts.
Improve instream habitat.	Install habitat features such as constructed steps, cover logs, and brush toes on restored reaches. Add woody materials to channel beds. Construct pools of varying depth.	There is no required performance standard for this metric.	Visual assessment
Restore and enhance native floodplain vegetation.	Convert active cattle pasture to forested riparian buffers along all Site streams, which will slow and treat runoff from adjacent pasture before entering streams. Protect and enhance existing forested riparian buffers. Treat invasive species.	In open areas planted with bare roots; Survival of 210 planted stems per acre at MY7. Interim survival of at least 320 planted stems at MY3 and at least 260 planted stems per acre at MY5. No success criteria is associated with shaded area planting.	Permanent and mobile 100 square meter vegetation plots within planted open riparian areas.
Treat concentrated agricultural runoff	Install agricultural BMPs in areas of concentrated agricultural runoff to treat runoff before it enters the stream channel.	There is no required performance standard for this metric.	Visual assessment.
Permanently protect the project site from harmful uses.	Establish a conservation easement on the Site. Exclude livestock from Site streams.	Record and close conservation easement prior to implementation.	Visual assessment

9.1 Monitoring Components

Project monitoring components are listed in more detail in Tables 16 and 17. Approximate locations of the proposed vegetation plots and cross section locations are illustrated in Figure 9.



Table 16: Monitoring Components

		Quantity/Lo		Length by Reach						
Parameter	Monitoring Feature	VC Reach 1	VC Reach 2	VC Reach 3	VC Reach 4	VC Reach 4 UT1		UT2 Reach 2	Frequency	Notes
Dimension	Riffle Cross-sections	N/A	N/A 1 3 N/A 1 N/A 1		Veer 1 2 2 F and 7	1				
Dimension	Pool Cross-sections	N/A	0	2	N/A	1	N/A	0	fedi 1, 2, 3, 5, dilu 7	T
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Substrate	Reach wide (RW) Pebble Count	N/A	1 RW	1 RW	N/A	1 RW	N/A	1 RW	Year 1, 2, 3, 5, and 7	3
Hydrology	Crest Gage (CG) and/or Transducer (SG)	N/A	N/A 1 CG		N/A	N/A	N/A	N/A	Semi-Annual	4
Vegetation	CVS Level 2/Mobile Plots (Permanent/Mobile)	8 (5/3)				Year 1, 2, 3, 5, and 7	5			
Visual		Y	Y	Y	Y	Y	Y	Y	Semi-Annual	
Exotic and										
nuisance									Semi-Annual	6
vegetation										
Project Boundary									Semi-Annual	7
Reference Photos	Photographs	17				Annual	8			

1. Cross-sections will be permanently marked with rebar to establish location. Surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.

- 2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile will be collected during as-built baseline monitoring survey only, unless observations indicate widespread lack of vertical stability (greater than 10% of reach is affected) and profile survey is warranted in additional years to monitor adjustments or survey repair work.
- 3. Riffle 100-count substrate sampling will be collected during the baseline monitoring only. Substrate assessments in subsequent monitoring years will consist of reachwide substrate monitoring.
- 4. Crest gages and/or stream gages will be monitored using automated pressure transducers. Transducers will set to record bank full events at least twice a day and stream flow at least every 3 hours and will be inspected quarterly or semi-annually. Evidence of bankfull and stream flow events will be documented with a photo when possible.
- 5. Both mobile and permanent vegetation plots will be utilized to evaluate the vegetation performance for the open areas planted. 2% of the open planted acreage will be monitored with permanent and mobile plots. Permanent vegetation monitoring plot assessments will follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments will document number of planted stems and species using a circular or 100 m2 square/rectangular plot. Planted shaded areas will be visually assessed.

Page 27

- 6. Locations of exotic and nuisance vegetation will be mapped
- 7. Locations of vegetation damage, boundary encroachments, etc. will be mapped.
- 8. 15 photo points will be installed as shown on Figure 9. 2 additional points will be established post-construction to document mature tree save areas.

			C						
Parameter	Monitoring Feature	UT3 Reach 1	UT3 Reach 2	UT4	UT5	UT6 Reach 1	UT6 Reach 2	Frequency	Notes
Dimension	Riffle Cross-sections	N/A	1	N/A	N/A	N/A	1	Veer 1 2 2 F and 7	1
Dimension	Pool Cross-sections	N/A	0	N/A	N/A	N/A	0	Year 1, 2, 3, 5, and 7	T
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	N/A	N/A	_
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2
Substrate	Reach wide (RW) pebble count	N/A	1 RW	N/A	N/A	N/A	1 RW	Year 1, 2, 3, 5, and 7	3
Stream Hydrology	Crest Gage (CG) and/or Transducer (SG)	N/A	N/A	N/A	N/A	N/A	N/A	Semi- Annual	4
Vegetation	CVS Level 2/Mobile Plots (Permanent/Mobile)	6 (4/2)				Year 1, 2, 3, 5, and 7	5		
Visual Assessment		Y	Y	Y	Y	Y	Y	Semi- Annual	
Exotic and nuisance vegetation								Semi- Annual	6
Project Boundary								Semi- Annual	7
Reference Photos	Photographs				9			Annual	

Table 17: Monitoring Components

1. Cross-sections will be permanently marked with rebar to establish location. Surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.

2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile will be collected during as-built baseline monitoring survey only, unless observations indicate widespread lack of vertical stability (greater than 10% of reach is affected) and profile survey is warranted in additional years to monitor adjustments or survey repair work.

3. Riffle 100-count substrate sampling will be collected during the baseline monitoring only. Substrate assessments in subsequent monitoring years will consist of reachwide substrate monitoring.

4. Crest gages and/or stream gages will be monitored using automated pressure transducers. Transducers will set to record bank full events at least twice a day and stream flow at least every 3 hours and will be inspected quarterly or semi-annually. Evidence of bankfull and stream flow events will be documented with a photo when possible.

5. Both mobile and permanent vegetation plots will be utilized to evaluate the vegetation performance for the open areas planted. 2% of the open planted acreage will be monitored with permanent and mobile plots. Permanent vegetation monitoring plot assessments will follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments will document number of planted stems and species using a circular or 100 m2 square/rectangular plot. Planted shaded areas will be visually assessed.

6. Locations of exotic and nuisance vegetation will be mapped

7. Locations of vegetation damage, boundary encroachments, etc. will be mapped.



10.0 Long-Term Management Plan

The Site will be transferred to the North Carolina Department of Environmental Quality (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. Funding will be supplied by the responsible party on a yearly basis until such time an endowment is established. 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 Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable.

The Stewardship Program will periodically install signage as needed to identify boundary markings as needed. Any livestock or associated fencing or permanent crossings will be the responsibility the owner of the underlying fee to maintain.

The Site Protection Instrument can be found in Appendix 8.

Long-Term Management Activity	Long-Term Manager Responsibility	Landowner Responsibility
Signage will be installed and maintained along the Site boundary to denote the area protected by the recorded conservation easement.	The long-term steward will be responsible for inspecting the Site boundary during periodic inspections (every one to three years) and for maintaining or replacing signage to ensure that the conservation easement area is clearly marked.	The landowner shall report damaged or missing signs to the long-term manager, as well as contact the long-term manager if a boundary needs to be marked, or clarification is needed regarding a boundary location. If land use changes in future and fencing is required to protect the easement, the landowner is responsible for installing appropriate approved fencing.
The Site will be protected in its entirety and managed under the terms outlined in the recorded conservation easement.	The long-term manager will be responsible for conducting annual inspections and for undertaking actions that are reasonably calculated to swiftly correct the conditions constituting a breach. The USACE, and their authorized agents, shall have the right to enter and inspect the Site and to take actions necessary to verify compliance with the conservation easement.	The landowner shall contact the long-term manager if clarification is needed regarding the restrictions associated with the recorded conservation easement.

Table 18: Long-term Management Plan



11.0 Adaptive Management Plan

Upon completion of Site construction, Wildlands will implement the post-construction monitoring defined in Sections 8 and 9. Project maintenance will be performed during the monitoring years to address minor issues as necessary (Appendix 9). If, during annual monitoring it is determined the Site's ability to achieve Site performance standards is jeopardized, Wildlands and DMS will notify the members of the NCIRT and work with the NCIRT to develop contingency plans and remedial actions.

12.0 Determination of Credits

Mitigation credits presented in Table 19 are projections based upon the proposed design. The Site is submitted for mitigation credit in the Yadkin 03040101. The credit ratios proposed for the Site have been developed in consultation with the NCIRT as summarized in technical memorandum dated September 25, 2018. This correspondence is included in Appendix 6.

- 1. The requested stream restoration credit ratio is 1:1 for mitigation activities that include reconstruction of stable channels and restoring floodplain connection.
- 2. Venable Creek Reach 2 is proposed for enhancement I credit at a 1.5:1 ratio.
- 3. Enhancement II is proposed at different ratios throughout the Site to reflect different stressors and levels of proposed treatment.
 - a. Venable Creek Reach 1 is proposed at 2.5:1 credit to reflect a combination of frequent cattle access, degraded buffers, and areas of erosion that require repair. Venable Creek Reach 4, while minimally impacted by cattle, is also proposed at 2.5:1 to account for more extensive bank repair and bench grading.
 - b. UT3 Reach 1, UT4, UT5, and UT6 Reach 1 are proposed at 3:1 credit to reflect cattle exclusion and spot erosion repair.
 - c. UT2 Reach 1 and UT2A are proposed at 4:1 credit to acknowledge that, while cattle currently graze the understory here and will be excluded, their impact is minimal and there is an existing forested canopy.
- 4. No credit is sought for the BMPs or for work required to extend UT2B to meet the new location of Venable Creek Reach 3.

Buffers proposed throughout the Site meet the minimum required 30-foot standard width for Mountain streams, and in most cases, far exceed it. The credit release schedule is provided in Appendix 11.



Table 19: Project Asset Table

Project Components							
Project Component or Reach ID	Existing Footage/ Acreage	Restoration Footage/ Acreage ^{1, 2, 3}	Mitigation Category	Restoration Level	Priority Level	Mitigation Ratio	Proposed Credit
Venable Creek Reach 1		90.966		EII	N/A	2.5	36.386
Venable Creek Reach 2	2 0 2 2	210.849	Cool	EI	P3, P4	1.5	140.566
Venable Creek Reach 3	3,823	1,646.644	000	R	P1	1	1,646.644
Venable Creek Reach 4		1,957.606		EII	P3, P4	2.5	783.042
UT1	179	272.885	Cool	R	P2	1	272.885
UT2 Reach 1		741.847	Cool	EII	N/A	4	185.462
UT2 Reach 2	1,154	342.364		R	P1	1	342.364
UT2A	889	893.238	Cool	EII	N/A	4	223.310
UT2B	34	69.963	Cool	N/A	N/A	0	0.000
UT3 Reach 1	1 220	783.837	Caal	EII	N/A	3	261.279
UT3 Reach 2	1,230	306.172	C001	R	P1/P2	1	306.172
UT4	446	440.341	Cool	EII	N/A	3	146.780
UT5	552	517.660	Cool	EII	N/A	3	172.553
UT6 Reach 1	EOO	213.725	Cool	EII	N/A	3	71.242
UT6 Reach 2	200	204.747	COOI	R	P1	1	204.747
Total Stream LF	8,901	8,692.843					

Project Credits							
Destanation Laval		Stream ²			Riparian Wetland		
Restoration Level	Warm	Cool	Cold	Riverine	Non-Riv	Wetland	
Restoration		2,772.812					
Re-establishment							
Rehabilitation							
Enhancement							
Enhancement I		140.566					
Enhancement II		1,880.054					
Creation							
Preservation							
Totals		4,793.432					

Notes:

1. Crossing lengths have been removed from credited stream footage.

2. No direct credit for BMPs.

3. UT6 originates within an overhead powerline easement. The conservation easement extends up to UT6's origin under the powerline, but proposed crediting does not begin until the stream exits the overhead easement.



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FIGURES



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WILDLANDS



Figure 1 Vicinity Map Honey Mill Mitigation Site Yadkin River Basin (3040101)





500 Feet 125 250 0 1 1

Figure 2 Site Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC





0	2	100		800)			1,6	600	Feet
1	1	1	Т	1	1	I.	1	l	I I	

A.

Figure 3 Watershed Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC





0 200 400 800 Feet



Figure 4 USGS Topographic Map Honey Mill Mitigation Site Yadkin River Basin (03040101)









Figure 5 Soils Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC



WILDLANDS 0 5 10 20 Miles

Figure 6 Reference Reach Vicinity Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

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Honey Mill Mitigation Site Design Discharge Analysis

Figure 7 Design Discharge Analysis Honey Mill Mitigation Site Yadkin River Basin (03040101)







Figure 8 Concept Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC







Figure 9 Monitoring Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC

APPENDIX 1 – Historic Aerial Photos

















APPENDIX 2 – Preliminary Jurisdictional Determination

U.S. ARMY CORPS OF ENGINEERS WILMINGTON DISTRICT

Action Id. SAW-2018-01789 County: Surry U.S.G.S. Quad: NC- Mount Airy South

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Requestor:	Wildlands Engineering, Inc.		
	Kristi Suggs		
Address:	1430 S Mint Street, Suite 104		
	Charlotte, NC 28203		
Telephone Number:	704-332-7754		
E-mail:	ksuggs@wildlandseng.com		
G: ()	40.1		
Size (acres)	<u>40.1</u>	Nearest Iown	<u>Mount Airy</u>
Nearest Waterway	<u>Ararat River</u>	River Basin	<u>Upper Pee Dee</u>
USGS HUC	<u>03040101</u>	Coordinates	Latitude: <u>36.429939</u>
			Longitude: <u>-80.610504</u>
Location description: N	Northeast of intersection of Siloam Rd.	& Little Mounta	in Church Rd, Mount Airy, North Carolina

Indicate Which of the Following Apply:

A. Preliminary Determination

- There appear to be **waters, including wetlands** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The **waters, including wetlands** have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. The approximate boundaries of these waters are shown on the enclosed revised delineation map submitted via email on <u>6/18/2020</u>. Therefore this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.
- □ There appear to be waters, including wetlands on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). However, since the waters, including wetlands have not been properly delineated, this preliminary jurisdiction determination may not be used in the permit evaluation process. Without a verified wetland delineation, this preliminary determination is merely an effective presumption of CWA/RHA jurisdiction over all of the waters, including wetlands at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the waters, including wetlands on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

B. Approved Determination

☐ There are Navigable Waters of the United States within the above described project area/property subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

There are waters, including wetlands on the above described project area/property subject to the permit requirements of Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

We recommend you have the **waters**, **including wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

The waters, including wetlands on your project area/property have been delineated and the delineation has been verified by the Corps. The approximate boundaries of these waters are shown on the enclosed delineation map dated \underline{DATE} . We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once

SAW-2018-01789

verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

The waters, including wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on **DATE**. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

- There are no waters of the U.S., to include wetlands, present on the above described project area/property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA).
 You should contact the Division of Coastal Management in Morehead City, NC, at (252) 808-2808 to determine their requirements.

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact <u>Steve Kichefski</u> at <u>828-271-7980 ext. 4234</u> or <u>steven.l.kichefski@usace.army.mil</u>.

C. Basis For Determination: Basis For Determination: <u>See the preliminary jurisdictional determination</u> form dated 07/16/2020.

D. Remarks: None.

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information (This information applies only to approved jurisdictional determinations as indicated in B. above)

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers South Atlantic Division Attn: Phillip Shannin, Review Officer 60 Forsyth Street SW, Room 10M15 Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by <u>Not applicable</u>.

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence. Corps Regulatory Official:

Date of JD: 07/16/2020 Expiration Date of JD: Not applicable

<u>SAW-2018-01789</u> The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Copy furnished:

Property Owner: Address:	<u>Mary Lou Venable</u> <u>140 Esses Lane</u>
Telephone Number:	<u>Mt. Airy, NC 27030</u> <u>336-469-9116</u>
Property Owner:	LuAnn Venable Brown

Property Owner:	LuAnn Venable Browne
Address:	929 Siloam Road
	Mt. Airy, NC 27030-7875
Telephone Number:	336-710-1313





150 300 Feet 0

Figure 3 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC


ろ	WIL	DLANDS

0	35	70 Feet
1	1	1



Venable Creek (3,834 LF) Perennial



Figure 3.1 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101) Surry County, NC





0	57.5	115 Feet
1	1	1



UT5 (377 LF) Intermittent



Figure 3.2 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101) Surry County, NC







Figure 3.3 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101) Surry County, NC







Figure 3.4 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC







Figure 3.5 Delineation Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Surry County, NC

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Appl	icant: Wildlands Engineering, Inc., Kristi Suggs	File Number: <u>SAW-2018-01789</u>	9 Date: <u>07/16/2020</u>	
Attac	ched is:		See Section below	
	INITIAL PROFFERED PERMIT (Standard Permit	or Letter of permission)	А	
	PROFFERED PERMIT (Standard Permit or Letter of permission)		В	
	PERMIT DENIAL		С	
	APPROVED JURISDICTIONAL DETERMINATION		D	
\boxtimes	PRELIMINARY JURISDICTIONAL DETERMINA	ATION	E	

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at or <u>http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx</u> or the Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:			
If you have questions regarding this decision and/or the	If you only have questions regarding the appeal process you may		
appeal process you may contact:	also contact:		
District Engineer, Wilmington Regulatory Division	Mr. Phillip Shannin, Administrative Appeal Review Officer		
Attn: Steve Kichefski	CESAD-PDO		
Asheville Regulatory Office	U.S. Army Corps of Engineers, South Atlantic Division		
U.S Army Corps of Engineers	60 Forsyth Street, Room 10M15		
151 Patton Avenue, Room 208	Atlanta, Georgia 30303-8801		
Asheville, North Carolina 28801	Phone: (404) 562-5137		
	· · ·		

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
Signature of appellant or agent		
Signature of appendit of agent.		

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Steve Kichefski, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and Approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Phillip Shannin, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 6/15/2020

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Wildlands Engineering, Inc., Kristi Suggs, 1430 S. Mint Street, #104, Charlotte, NC 28203

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Honey Mill Mitigation Site, SAW-2018-01789

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: Northeast of intersection of Siloam Rd. & Little Mountain Church Rd, Mount Airy, North Carolina (no address assigned)

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: North CarolinaCounty: SurryCity: AraratCenter coordinates of site (lat/long in degree decimal format): Latitude: 34.429939 Longitude: -80.610504

Universal Transverse Mercator: UTM 17

Name of nearest waterbody: Ararat River

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

□ Office (Desk) Determination. Date:

⊠ Field Determination. Date(s): 9/4/19- 9/5/19, 9/14/19, 2/27/20, and 6/8/2020

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non- wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
1.) Venable Creek	36.425879	-80.613589	3,834 LF	Non-wetland waters	Section 404
2.) UT1	36.426044	-80.613817	179 LF	Non-wetland waters	Section 404
3.) UT2 (Intermittent)	36.426881	-80.608853	16 LF	Non-wetland waters	Section 404
4.) UT2 (Perennial)	36.426990	-80.608943	1,154 LF	Non-wetland waters	Section 404
5.) UT2A	36.426248	-80.609019	889 LF	Non-wetland waters	Section 404
6.) UT2B	36.428882	-80.609401	664 LF	Non-wetland waters	Section 404
7.) UT3	36.429889	-80.614057	1,236 LF	Non-wetland waters	Section 404
8.) UT4	36.430599	-80.611440	446 LF	Non-wetland waters	Section 404
9.) UT5 (Intermittent)	36.430541	-80.607658	377 LF	Non-wetland waters	Section 404
10.) UT5 (Perennial)	36.430603	-80.607719	447 LF	Non-wetland waters	Section 404
11.) UT5 Relic	36.431264	-80.608222	82 LF	Non-wetland waters	Section 404

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non- wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
12.) UT6	36.433433	-80.608325	588 LF	Non-wetland waters	Section 404
13.) UT6 Relic	36.432644	-80.607187	80 LF	Non-wetland waters	Section 404
12.) Wetland A	35.426942	-80.612880	0.018 AC	Wetland waters	Section 404
13.) Wetland B	36.427306	-80.612717	0.048 AC	Wetland waters	Section 404
14.) Wetland C	36.428046	-80.611172	0.346 AC	Wetland waters	Section 404
15.) Wetland D	36.427050	-80.609040	0.067 AC	Wetland waters	Section 404
16.) Wetland E	36.426181	-80.608940	0.007 AC	Wetland waters	Section 404
17.) Wetland F	36.426281	-80.609024	0.013 AC	Wetland waters	Section 404
18.) Wetland G	36.426357	-80.609314	0.004 AC	Wetland waters	Section 404
19.) Wetland H	36.426479	-80.609337	0.008 AC	Wetland waters	Section 404
20.) Wetland I	36.426849	-80.609749	0.005 AC	Wetland waters	Section 404
21.) Wetland J	36.427269	-80.610497	0.015 AC	Wetland waters	Section 404
22.) Wetland K	36.429045	-80.611301	0.374 AC	Wetland waters	Section 404
23.) Wetland L	36.429256	-80.611588	0.003 AC	Wetland waters	Section 404
24.) Wetland M	36.429073	-80.611946	0.004 AC	Wetland waters	Section 404
25.) Wetland N	36.429230	-80.612564	0.001 AC	Wetland waters	Section 404
26.) Wetland O	36.429285	-80.612746	0.022 AC	Wetland waters	Section 404
27.) Wetland P	36.429317	-80.613007	0.007 AC	Wetland waters	Section 404
28.) Wetland Q	36.429539	-80.613510	0.001 AC	Wetland waters	Section 404

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resources in review area (acreage and linear feet, if applicable	Type of aquatic resources (i.e., wetland vs. non- wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
29.) Wetland R	36.429623	-80.613594	0.005 AC	Wetland waters	Section 404
30.) Wetland S	36.429745	-80.613899	0.004 AC	Wetland waters	Section 404
31.) Wetland T	36.429924	-80.614006	0.026 AC	Wetland waters	Section 404
32.) Wetland U	36.429974	-80.614128	0.013 AC	Wetland waters	Section 404
33.) Wetland V	36.430099	-80.614204	0.005 AC	Wetland waters	Section 404
34.) Wetland W	36.430595	-80.611343	0.012 AC	Wetland waters	Section 404
35.) Wetland X	36.430542	-80.611153	0.003 AC	Wetland waters	Section 404
36.) Wetland Y	36.433434	-80.608192	0.002 AC	Wetland waters	Section 404
37.) Wetland Z	36.433403	-80.608109	0.001 AC	Wetland waters	Section 404
38.) Wetland AA	36.433101	-80.607728	0.005 AC	Wetland waters	Section 404
39.) Wetland BB	36.429240	-80.612340	0.005 AC	Wetland waters	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre- construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area

affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "may be" waters of the U.S. and/or that there "may be" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: Map: <u>GIS figures including Vicinity, USGS Topographic, Delineation, & Soils</u>
X Data sheets prepared/submitted by or on behalf of the PJD requestor.
Office concurs with data sheets/delineation report.
Office does not concur with data sheets/delineation report. Rationale:
Data sheets prepared by the Corps:
Corps navigable waters' study:
U.S. Geological Survey Hydrologic Atlas:
USGS NHD data.
USGS 8 and 12 digit HUC maps.
🛛 U.S. Geological Survey map(s). Cite scale & quad name: <u>1:24,000 Scale Mount Airy South quadrangle</u>
X Natural Resources Conservation Service Soil Survey. Citation: NRCS Web Soils Survey Website
X National wetlands inventory map(s). Cite name: <u>USFWS National Wetlands Inventory (Online Mapper)</u>
State/local wetland inventory map(s):
FEMA/FIRM maps:
100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)
Photographs: Aerial (Name & Date): 2018 aerial on GIS figures with submittal.
or Other (Name & Date): <u>Representative site photos with submittal.</u>
Previous determination(s). File no. and date of response letter:
Other information (please specify):

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and date of Regulatory staff member completing PJD **DATE** $7/l(c/2c_{20})$

rist 1

impracticable)¹

6/15/2020 Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is

¹ Districts may establish timeframes for requester to return signed PJD forms. If the requester does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

APPENDIX 3 – DWR and NCSAM Identification Forms



Date: 3/8/2018	Project/Site: Honey Mill	Latitude: 36,426033
Evaluator: MC/JS	County: Surry	Longitude: - 30,613814
Total Points:Stream is at least intermittentif \geq 19 or perennial if \geq 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other e.g. Quad Name: MTI

A. Geomorphology (Subtotal = <u> 9.5</u>)	Absent	Weak	Moderate	Strong
1 ^{a.} Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	্র
A Particle size of stream substrate				
4. Particle Size of Stream Substrate	0		2	<u></u>
6. Dependitional hora as hereines	0	1	<u></u>	3
Depositional bars of benches	0	<u>(1)</u>	2	3
	0	1	<u></u>	3
8. Headcuts		1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	0	1.5
11. Second or greater order channel	N	o = 0	⊆Yes :	= 3)
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u>\</u> \(<u>)</u> ₅ <u>></u>)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	\bigcirc	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	\bigcirc	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	N	o = 0	(Yes =	3
C. Biology (Subtotal =)				
18. Fibrous roots in streambed	$\overline{3}$	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish		0.5	1	1.5
23. Crayfish	$\langle 0 \rangle$	0.5	1	1.5
24. Amphibians		0.5	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; C	DBL = 1.5 Other = 0	>
*perennial streams may also be identified using other methods.	See p. 35 of manua	II.	and the second s	
Notes:				

Sketch:

Mayfly (3+) Right Shart (1)

9/416

NC DWQ Stream	Identification	Form	Version	4.11

Date: 3/8/2018	Project/Site: Haney Mill	Latitude: 36,475886
Evaluator: MC1JS	County: Swary	Longitude: 80,613631
Total Points: Stream is at least intermittent if \geq 19 or perennial if \geq 30*	Stream Determination (circle one) Ephemeral Intermittent (Perennial	Other Venable Crock e.g. Quad Name: Mainstom

A. Geomorphology (Subtotal = <u>2</u>)	Absent	Weak	Moderate	Strong
1 ^ª Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	
ripple-pool sequence			4	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	11	2	3
8. Headcuts ? none in Reach !	0		2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No	o = 0	Yes	= 3 2
artificial ditches are not rated; see discussions in manual				* Jr 45 -
B. Hydrology (Subtotal =)				verifiel .
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	े 3
14. Leaf litter	1.5 (~	- D	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0 Yes = 3			= 3
C. Biology (Subtotal = 11.5)			L	
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	$\overline{2}$	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish		0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae		0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75: (DBL = 1.5 (Other = 0	
*perennial streams may also be identified using other methods.	See p. 35 of manual			22
Notes:	•			
			· · · · · · · · · · · · · · · · · · ·	

-stone Fly(12) -Salamandus(2) - dragen fly

Snaits

Ved 914119

Date: 3/8/2018	Project/Site: Honey Mill	Latitude: 36,426229
Evaluator: MCIJS	County: Scally	Longitude:80,609036
Total Points:Stream is at least intermittentif \geq 19 or perennial if \geq 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name: UTZA

A. Geomorphology (Subtotal = 155)	Absent	Weak	Modorato	Strong
1 ^a Continuity of channel bed and bank	0	vvean	Woderate	Suong
2 Sinuosity of channel along thatwee	0		2	-> 3
3. In-channel structure: ex_riffle-pool_step-pool_	0		۷	3
ripple-pool sequence	0	1	2 .	3
4. Particle size of stream substrate	0	1	(2) -	-> 3
5. Active/relict floodplain	0	Ð	2	3
6. Depositional bars or benches	0	0 ~	-7 2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	<u> </u>	-> 1.5
10. Natural valley	0	0.5	1	9.5
11. Second or greater order channel	(No	o = 0 >>	Yes :	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = <u> </u>	.			
12. Presence of Baseflow	0	1	2> -	> 3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5 🧹	-0	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0 Yes = 3			= 3 /
C. Biology (Subtotal = (2))				
18. Fibrous roots in streambed	33	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	\bigcirc	0.5	1	1.5
23. Crayfish	$\langle 0 \rangle$	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	$\langle 0 \rangle$	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; C	BL = 1.5 Qther = 0)
*perennial streams may also be identified using other methods. S	See p. 35 of manua	I.		
Notes:	•			

Sketch:

Salamanders (2) May (2+) (Nano Fiy (2) Mgntsnail (10+)

•

Date: 2-27-20	Project/Site:	toney Mill	Latitude: 3(e	426881
Evaluator: I. Eckardt	County: Surry		Longitude:	30.608853
Total Points:Stream is at least intermittentif \geq 19 or perennial if \geq 30*	Stream Determ Ephemeral Inte	ination (circle one) ermittent)Perennial	Other UT2 e.g. Quad Name:	(upper)
A. Geomorphology (Subtotal =7)	Absent	Weak	Moderate	Strong
1 ^{a.} Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
 In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence 	0	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	\bigcirc	1	2	3
6. Depositional bars or benches	\bigcirc	. 1	2	3
7. Recent alluvial deposits	Q	1	2	3
8. Headcuts	\bigcirc	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	1.	(1.5)
11. Second or greater order channel	(N	ò = 0)	Yes = 3	
artificial ditches are not rated; see discussions in manual		and a second		
B. Hydrology (Subtotal = $+5$)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	Û	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	Q	0.5	1	1.5
16. Organic debris lines or piles	\bigcirc	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	(Yes	= 3)
C. Biology (Subtotal = <u>6</u>)			and the second se	
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	\bigcirc	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	<u>(</u>)	0.5	1	1.5
23. Crayfish	<u> </u>	0.5	1	1.5
24. Amphibians	<u> </u>	0.5	1	1.5
25. Algae	\bigcirc	0.5	1	1.5
26. Wetland plants in streambed FACW = 0.75; OBL = 1.5 Other = 0				
*perennial streams may also be identified using other methods. See p. 35 of manual.				
Notes: Short (= 20') of weak channel	below 1 gra	Le drop off a	Jours the	11-68 + S.J.
channel. Reach has water throughout but d	iff. cult to see	a busitlan.		
Sketch:				

Date: 9-4-19	Project/Site: Honey Mill	Latitude: 36.42699
Evaluator: I, Eckarolt	County: Surry	Longitude: -80.608943
Total Points:Stream is at least intermittentif \geq 19 or perennial if \geq 30*	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other UT2 e.g. Quad Name:

A. Geomorphology (Subtotal =)	Absent	Weak	Moderate	Strong
1ª. Continuity of channel bed and bank weaker in wet	0	1	(2)~/	3
2. Sinuosity of channel along thalweg	™ 0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool,		a)	2	2
ripple-pool sequence	0		2	ა
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	<u>()</u>	<u> </u>	2	3
8. Headcuts	0	1	<u>(</u> 2)	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(N	ó = 0)	Yes =	= 3
^a artificial ditches are not rated; see discussions in manual				
B. Hydrology (Subtotal = 10,5)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1 ~~	1.5
17. Soil-based evidence of high water table?	N	o = 0	(Yes =	: 3
C. Biology (Subtotal = 12.75)	~		and the second se	and the second
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	(2) -	3
21. Aquatic Mollusks	0	1	2	(3)
22. Fish	(6)	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	$(\hat{1})$	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			
*perennial streams may also be identified using other methods. S	See p. 35 of manua	al.		
Notes: 10+ right handal smile 10+	CONTRO	2 56 6 M A.	hard	
Sketch:			-	

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NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

UUUUUUUUU

NC DWQ Stream Identification Form	n Version 4.11					
Date: 1-8-20	Project/Site:	toncy Mill	Latitude: 3(0.430151		
Evaluator: IEEW	County:	Juny	Longitude: -	81. 61423		
Total Points:Stream is at least intermittent if \geq 19 or perennial if \geq 30*30,5	Stream Determi Ephemeral Inte	nation (circle one rmittent Perennia) Other al e.g. Quad Name:	Other I e.g. Quad Name: UT3		
A. Geomorphology (Subtotal = 13)	Absent	Weak	Moderate	Strong		
1 ^a Continuity of channel bed and bank	0	1	(2)	3		
2. Sinuosity of channel along thalweg	0	1	2	3		
3. In-channel structure: ex. riffle-pool, step-pool,	0	1	2	3		
A Particle size of stream substrate	0	1	(2)	3		
5 Active/relict floodplain	0	1	(2)	3		
6. Depositional bars or benches	- O	1	2	3		
7 Recent alluvial deposits		1	2	3		
8 Headouts		1	2	(3)		
9 Grade control		0.5	1	1.5		
10 Natural vallev	0	0.5	(1)	1.5		
11 Second or greater order channel	N	$\overline{0} = 0$	Yes	= 3		
^a artificial ditches are not rated; see discussions in manual			I.,,,			
B Hydrology (Subtotal = 100)						
12 Presence of Baseflow	0	1	2	(3)		
12. Irop ovidizing bacteria		1	3	3		
14. Loof litter		1	0.5	0		
15. Sediment on plants or debris		0.5	1	1.5		
16. Organic debris lines or niles		(05)	1	1.5		
17 Soil-based evidence of high water table?	N	$\overline{0} = 0$	Yes	=3)		
C Biology (Subtotal = 1.5)	<u></u>	<u></u>	1 >			
18 Eibrous roots in streambed	(3)	2	1	0		
19. Rooted upland plants in streambed	3	2	1	0		
20 Macrobenthos (note diversity and abundance)	<u> </u>	1	2	3		
21 Aquatic Mollusks		1	2	3		
22 Fish		0.5	1	1.5		
23 Cravfish	6	0.5	1	1.5		
24 Amphibians	0	0.5	1	1.5		
25. Algae	- X	0.5	_ 1	1.5		
26. Wetland plants in streambed		FACW = 0.75;	OBL = 1.5 Other = 1	0		
*perennial streams may also be identified using other method	ods. See p. 35 of manua	al.				
Notes: Callle trample bed	banks y	house	+. Starts	perrenial		
at headelet. No a	GARDS OC	bindy ta	und.	<i>k</i>		
Sketch:						

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

Ved

9/1419

Date: 3 8 18	Project/Site:	toney Mill	Latitude: 30	. 43065
Evaluator: MC 35	County:	Suan	Longitude:	10.61162
Total Points: Stream is at least intermittent 공나 if ≥ 19 or perennial if ≥ 30*	Stream Determi Ephemeral Inte	nation (circle one) rmittent Perennial	Other e.g. Quad Name:	UTY
A. Geomorphology (Subtotal = 5)	Absent	Weak	Moderate	Strong
1 ^a Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	<u>(2)</u>	3
5. Active/relict floodplain	0		2	3
6. Depositional bars or benches	0	<u> </u>	2	3
7. Recent alluvial deposits	0	<u> </u>	22	3
8. Headcuts	0	1		3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	N	o = 0	Yes	= 3
^a artificial ditches are not rated; see discussions in manual B. Hydrology (Subtotal =)			~	1
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	<u> </u>	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	N	o = 0	Yes	= 3)
C. Biology (Subtotal = 10)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	11	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	11	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	<u> </u>	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed		FACW = 0.75; OB	L = 1.5 Other =	0)
*perennial streams may also be identified using other met Notes: Salamanolle (2) Cas	hods. See p. 35 of manua Lais fry C mu	al. Utiple), Sc	nail	
Sketch:	<u></u>			

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P

| Date: 218/2018                                                           | Project/Site:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                         |                                |            |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|--------------------------------|------------|
|                                                                          | Project/Site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Enery Mill              | Latitude: 3(                   | -, 430,671 |
| Evaluator: MC735                                                         | County: 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NG                      | Longitude:                     | 80,60792   |
| Total Points:                                                            | Stream Determ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ination (circle one     | e) Other                       |            |
| if $\geq$ 19 or perennial if $\geq$ 30* $\leq$ $\leq$ $\leq$             | Ephemeral Int                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ermittent Perenni       | e.g. Quad Name                 | : UISLOW   |
| A. Geomorphology (Subtotal = $14.5$ )                                    | Abcont                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Monte                   |                                | 1          |
| 1 <sup>ª</sup> Continuity of channel bed and bank                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | vveak                   | Woderate                       | Strong     |
| 2. Sinuosity of channel along thalweg                                    | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (7)                     | 2                              | 3          |
| 3. In-channel structure: ex. riffle-pool, step-pool.                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         | 2                              | 3          |
| ripple-pool sequence                                                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | 2                              | 3          |
| 4. Particle size of stream substrate                                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | 2                              |            |
| 5. Active/relict floodplain                                              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         | 2                              | 3          |
| 6. Depositional bars or benches                                          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | 2                              | 3          |
| 7. Recent alluvial deposits                                              | 05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1                       | 2                              | 3          |
| 8. Headcuts                                                              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | $\overline{(2)}$               | 3          |
| 9. Grade control                                                         | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.5                     | <u> </u>                       | 1.5        |
| 10. Natural valley                                                       | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.5                     | 1                              | 1.5        |
| 11. Second or greater order channel                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $p = 0^{2}$             | Yes                            | = 3        |
| <sup>a</sup> artificial ditches are not rated; see discussions in manual |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         | 103                            | 5          |
| B. Hydrology (Subtotal = 73, 5)                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                |            |
| 12. Presence of Baseflow                                                 | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | $\bigcirc$                     | 3          |
| 13. Iron oxidizing bacteria                                              | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                                |            |
| 14. Leaf litter                                                          | 1.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         | 2                              | 3          |
| 15. Sediment on plants or debris                                         | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         | 0.5                            | 1.5        |
| 16. Organic debris lines or piles                                        | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0.5                     | Jan Strange                    | 1.5        |
| 17. Soil-based evidence of high water table?                             | No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 0 = 0                   | (Yes-                          | 1.5        |
| C. Biology (Subtotal = 11, 5)                                            | I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                                | <u> </u>   |
| 18. Fibrous roots in streambed                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2                       | 1                              |            |
| 19. Rooted upland plants in streambed                                    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2                       | 1                              | 0          |
| 20. Macrobenthos (note diversity and abundance)                          | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | (2)                            |            |
| 21. Aquatic Mollusks                                                     | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                       | 2                              |            |
| 22. Fish                                                                 | $\langle \sigma \rangle$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.5                     | 1                              | 1.5        |
| 23. Crayfish                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.5                     | 1                              | 1.5        |
| 24. Amphibians                                                           | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (05)                    | 1                              | 1.5        |
| 25. Algae                                                                | C.O.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5                     | 1                              | 1.5        |
| 26. Wetland plants in streambed                                          | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | $FACW = 0.75^{\circ}$ O | $\frac{1}{Bl} = 1.5$ Other = 0 | 1.5        |
| *perennial streams may also be identified using other method             | ds. See p. 35 of manual                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                         |                                |            |
| Notes: Downstream of HC u                                                | VIT ME LIM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Naver hed               | m ind low                      | 011        |
| GRONNER DINO LOCAL                                                       | the state of the s | <u></u>                 | CLV CA KACA                    | 1 M        |
| sketch: Right Shail (11+)                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                |            |
| watersniplen (2+)                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                |            |
| Sala no a noder                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                         |                                |            |

UT Slaver

| Date:  -8-20                                                                        | Project/Site: Honey Mill                                              | Latitude: 36.430541                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------|
| Evaluator: IE/EW                                                                    | County: Surry                                                         | Longitude: - 80. (651(58                                      |
| Total Points:Stream is at least intermittentif $\geq$ 19 or perennial if $\geq$ 30* | Stream Determination (circle one)<br>Ephemeral Intermittent Perennial | Other UTS (Steeper, confind<br>e.g. Quad Name: Valley Section |

| A. Geomorphology (Subtotal =)                                                                       | Absent                        | Weak           | Moderate                              | Strong    |
|-----------------------------------------------------------------------------------------------------|-------------------------------|----------------|---------------------------------------|-----------|
| 1ª. Continuity of channel bed and bank small sections of                                            | 0                             | 1              | (2)                                   | 3         |
| 2. Sinuosity of channel along thalweg                                                               | 0                             | (1)            | 2                                     | 3         |
| 3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence                           | 0                             | 1              | 2                                     | 3         |
| 4. Particle size of stream substrate                                                                | 0                             | 1              | 2                                     | (3)       |
| 5. Active/relict floodplain Continue Valley                                                         | $\bigcirc$                    | 1              | 2                                     | 3         |
| 6. Depositional bars or benches                                                                     | $\overline{0}$                | 1              | 2                                     | 3         |
| 7. Recent alluvial deposits                                                                         | $\bigcirc$                    | 1              | 2                                     | 3         |
| 8. Headcuts                                                                                         | ( <b>0</b> )                  | 1              | 2                                     | 3         |
| 9. Grade control                                                                                    | 0                             | 0.5            | 1                                     | (1.5)     |
| 10. Natural valley                                                                                  | 0                             | 0.5            | 1                                     | (1.5)     |
| 11. Second or greater order channel                                                                 | (N                            | o = 0 )        | Yes                                   | = 3       |
| <sup>a</sup> artificial ditches are not rated; see discussions in manual                            |                               |                | · · · · · · · · · · · · · · · · · · · |           |
| B. Hydrology (Subtotal =)                                                                           |                               |                | ······                                |           |
| 12. Presence of Baseflow Werk trickle for majority                                                  | 0                             | 1              | (2)                                   | 3         |
| 13. Iron oxidizing bacteria                                                                         | (0)                           | 1              | 2                                     | 3         |
| 14. Leaf litter                                                                                     | 1.5                           | 1              | (0.5)                                 | 0         |
| 15. Sediment on plants or debris                                                                    | 0                             | 0.5)           | 1                                     | 1.5       |
| 16. Organic debris lines or piles                                                                   | $\bigcirc$                    | 0.5            | 1                                     | 1.5       |
| 17. Soil-based evidence of high water table?                                                        | water table? No = 0 (Yes = 3) |                |                                       |           |
| C. Biology (Subtotal =)                                                                             |                               |                |                                       |           |
| 18. Fibrous roots in streambed                                                                      | (3)                           | 2              | 1                                     | 0         |
| 19. Rooted upland plants in streambed                                                               | (3)                           | 2              | 1                                     | 0         |
| 20. Macrobenthos (note diversity and abundance) I mide                                              | 0                             | (1)            | 2                                     | 3         |
| 21. Aquatic Mollusks 10+ right hand sail                                                            | 0                             | 1              | 2                                     | (3)       |
| 22. Fish                                                                                            | $\widetilde{O}$               | 0.5            | 1                                     | 1.5       |
| 23. Crayfish                                                                                        | $\odot$                       | 0.5            | 1                                     | 1.5       |
| 24. Amphibians 3 salamandri                                                                         | 0                             | 0.5            | (1)                                   | 1.5       |
| 25. Algae                                                                                           | (ò)                           | 0.5            | 1                                     | 1.5       |
| 26. Wetland plants in streambed                                                                     |                               | FACW = 0.75; 0 | OBL = 1.5(Other = 0                   | $\sim$    |
| *perennial streams may also be identified using other methods. S                                    | See p. 35 of manua            | al.            |                                       |           |
| Notes: Steep, step/pool (micro pools) over bouldry, barade and collable. Wede bourbar frickle being |                               |                |                                       | le begins |
| more than is up strep confined where above previously meeped erach. Short sections of               |                               |                |                                       |           |
| subsurface there early collevial material in channel.                                               |                               |                |                                       |           |
|                                                                                                     |                               |                |                                       |           |
|                                                                                                     |                               |                |                                       |           |
|                                                                                                     |                               |                |                                       |           |

# UT 5 A

| Date: 09-04-19                                                                      | Project/Site:                         | toney Mill                                                                                                     | Latitude: 36,            | 430600                   |  |
|-------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--|
| Evaluator: KS/JT/EW                                                                 | County: S                             | urry                                                                                                           | Longitude: -30, 607 84   |                          |  |
| Total Points:Stream is at least intermittentif $\geq$ 19 or perennial if $\geq$ 30* | Stream Determ<br>Ephemeral Inte       | ination (circle one)<br>ermittent Perennial                                                                    | Other<br>e.g. Quad Name: | Other<br>e.g. Quad Name: |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
| A. Geomorphology (Subtotal = <u>12</u> )                                            | Absent                                | Weak                                                                                                           | Moderate                 | Strong                   |  |
| 1 <sup>a.</sup> Continuity of channel bed and bank                                  | 0                                     | 1                                                                                                              | (2)                      | 3                        |  |
| 2. Sinuosity of channel along thalweg                                               | 0                                     |                                                                                                                | 2                        | 3                        |  |
| 3. In-channel structure: ex. riffle-pool, step-pool,                                | 0                                     | 1                                                                                                              | 2 2                      | 6 3                      |  |
| ripple-pool sequence                                                                |                                       |                                                                                                                |                          |                          |  |
| 4. Particle size of stream substrate                                                | 0                                     |                                                                                                                | 2                        |                          |  |
| 5. Active/relict floodplain                                                         | 0                                     |                                                                                                                | 2                        | 3                        |  |
| 6. Depositional bars of benches                                                     |                                       | 1                                                                                                              | 2                        | 3                        |  |
| 7. Recent alluvial deposits                                                         |                                       |                                                                                                                | 2                        | 3                        |  |
| 8. Headcuis                                                                         |                                       |                                                                                                                | 2                        | 3                        |  |
|                                                                                     | -1                                    | 0.5                                                                                                            | 1                        | 1.5                      |  |
|                                                                                     |                                       | 0.5                                                                                                            | 1                        | (1.5)                    |  |
| <sup>a</sup> ortificial ditabas are pet rotadi and discussions in manual            | N                                     | <u>o=0</u>                                                                                                     | Yes                      | = 3                      |  |
| P. Hydrology (Subtotol =                                                            |                                       | Synamosconego and a second |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
| 12. Presence of Baseflow                                                            |                                       | 1                                                                                                              | 2                        | 3                        |  |
| 13. Iron oxidizing bacteria                                                         | (0)                                   | 1                                                                                                              | 2                        | 3                        |  |
| 14. Leaf litter                                                                     | 1.5                                   | 1                                                                                                              | 0.5                      | <u>(0)</u>               |  |
| 15. Sediment on plants or debris                                                    |                                       | 0.5                                                                                                            | 1                        | 1.5                      |  |
| 16. Organic debris lines or piles                                                   |                                       | (0,5')                                                                                                         | 1                        | 1.5                      |  |
| 17. Soil-based evidence of high water table?                                        | N                                     | q = 0                                                                                                          | Yes                      | = 3                      |  |
| C. Biology (Subtotal =)                                                             | · · · · · · · · · · · · · · · · · · · |                                                                                                                |                          | r                        |  |
| 18. Fibrous roots in streambed                                                      | 3                                     | 2                                                                                                              | 1                        | 0                        |  |
| 19. Rooted upland plants in streambed                                               | -3                                    | 2                                                                                                              | 1                        | 0                        |  |
| 20. Macrobenthos (note diversity and abundance)                                     |                                       | 1                                                                                                              | 2                        | 3                        |  |
| 21. Aquatic Mollusks                                                                | (0')                                  | 1                                                                                                              | 2                        | 3                        |  |
| 22. Fish                                                                            |                                       | 0.5                                                                                                            | 1                        | 1.5                      |  |
| 23. Crayfish                                                                        | (0)                                   | 0.5                                                                                                            | 1                        | 1.5                      |  |
| 24. Amphibians                                                                      |                                       | 0.5                                                                                                            | 1                        | 1.5                      |  |
| 25. Algae                                                                           | (0`)                                  | 0.5                                                                                                            | 1                        | 1.5                      |  |
| 26. Wetland plants in streambed                                                     |                                       | FACW = 0.75; OB                                                                                                | L = 1.5 (Other = 0       | <u>)</u>                 |  |
| *perennial streams may also be identified using other meth                          | ods. See p. 35 of manu                | al.                                                                                                            |                          |                          |  |
| Notes:                                                                              |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
| Sketch                                                                              |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |
|                                                                                     |                                       |                                                                                                                |                          |                          |  |

Jede

| Date: 31812018                                                                      | Project/Site: Honey Mill                                                    | Latitude: 36.4339165           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------|
| Evaluator: MC155                                                                    | County: Surry                                                               | Longitude: _ 86.668369         |
| Total Points:Stream is at least intermittentif $\geq$ 19 or perennial if $\geq$ 30* | 0<br>Stream Determination (circle one)<br>Ephemeral Intermittent (Perennial | Other<br>e.g. Quad Name: UT () |

| A. Geomorphology (Subtotal = 5)                                          | Absent             | Weak                  | Moderate                 | Strong  |
|--------------------------------------------------------------------------|--------------------|-----------------------|--------------------------|---------|
| 1 <sup>ª</sup> Continuity of channel bed and bank                        | 0                  | 1                     | 2                        | 3       |
| 2. Sinuosity of channel along thalweg                                    | 0                  | 1                     | 2                        | 3       |
| 3. In-channel structure: ex. riffle-pool, step-pool,                     | 0                  | 1                     | (2)                      | 3       |
| 4 Particle size of stream substrate                                      |                    |                       |                          |         |
| 5 Active/relict floodplain                                               | 0                  |                       | 2                        | 3       |
| 6. Denositional bars or benches                                          | 0                  |                       | 2                        | 3       |
| 7 Recent alluvial deposite                                               | 0                  |                       | 2                        | 3       |
| 8 Headcuts                                                               | 0                  | Con Lawrence          | 2                        | 3       |
| 9 Grade control                                                          | 0                  | 1                     | 2                        | 3       |
| 10. Natural valley                                                       | 0                  | (0.5)                 | 1                        | 1.5     |
| 11 Second or greater order channel                                       | 0                  | 0.5                   | 1                        | (1.5)   |
| <sup>a</sup> artificial ditches are not rated: see discussions in manual |                    | 0=0>                  | Yes =                    | = 3     |
| B. Hydrology (Subtotal =)                                                |                    |                       | •                        |         |
| 12. Presence of Baseflow                                                 | 0                  | 1                     | 2>                       | 3       |
| 13. Iron oxidizing bacteria                                              | 0                  | 1                     | $\sim$                   | 2       |
| 14. Leaf litter                                                          | 1.5                | (1)                   | 0.5                      |         |
| 15. Sediment on plants or debris                                         | 0                  | (15)                  | 1                        | 1.5     |
| 16. Organic debris lines or piles                                        | 0                  | 05                    | 1                        | 1.5     |
| 17. Soil-based evidence of high water table?                             | No = 0 (Yes = 3)   |                       |                          |         |
| C. Biology (Subtotal = 0)                                                | 1                  |                       |                          | er Held |
| 18. Fibrous roots in streambed                                           | $\overline{3}$     | 2                     | 1                        | 0       |
| 19. Rooted upland plants in streambed                                    | 3>                 | 2                     | 1                        | 0       |
| 20. Macrobenthos (note diversity and abundance)                          | 0                  | 1                     | $\overline{\mathcal{D}}$ | 3       |
| 21. Aquatic Mollusks                                                     | 0                  | (1)                   | 2                        | 3       |
| 22. Fish                                                                 | 0                  | 0.5                   | 1                        | 1.5     |
| 23. Crayfish                                                             | 0                  | 0.5                   | 1                        | 1.5     |
| 24. Amphibians                                                           | 0                  | 0.5                   | (13)                     | 1.5     |
| 25. Algae                                                                | 0                  | 0.5                   | 1                        | 1.5     |
| 26. Wetland plants in streambed                                          |                    | $FACW = 0.75^{\circ}$ | BI = 15 Other = 0        | 1.0     |
| *perennial streams may also be identified using other methods. S         | See p. 35 of manua | ıl.                   |                          |         |
| Notes:                                                                   |                    |                       |                          |         |
|                                                                          |                    |                       |                          |         |
|                                                                          |                    |                       |                          |         |
| Sketch: - DragonFlug(U) - Salar                                          | hander             | - (2)                 |                          |         |

Jed 915119

| Date: 318118                                                                               | Project/Site: Harry Mill                                              | Latitude: 36.437607                |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------|
| Evaluator: MC155                                                                           | County: SUNIY                                                         | Longitude: 80.607203               |
| Total Points:Stream is at least intermittentif $\geq 19$ or perennial if $\geq 30^{\circ}$ | Stream Determination (circle one)<br>Ephemeral Intermittent Berennial | Other<br>e.g. Quad Name: UT6 Relic |

| A. Geomorphology_(Subtotal = 10.5_)                                      | Absent              | Weak          | Moderate                               | Strong                             |
|--------------------------------------------------------------------------|---------------------|---------------|----------------------------------------|------------------------------------|
| 1 <sup>ª</sup> Continuity of channel bed and bank                        | 0                   | 1             | 2                                      | (3)                                |
| 2. Sinuosity of channel along thalweg                                    | 0                   |               | 2                                      | 3                                  |
| 3. In-channel structure: ex. riffle-pool, step-pool,                     | 0                   | - Contraction | _                                      | -                                  |
| ripple-pool sequence                                                     | 0                   |               | 2                                      | 3                                  |
| 4. Particle size of stream substrate                                     | 0                   |               | 2                                      | 3                                  |
| 5. Active/relict floodplain                                              | 0                   | 1             | 2                                      | 3                                  |
| 6. Depositional bars or benches                                          | $\bigcirc$          | 1             | 2                                      | 3                                  |
| 7. Recent alluvial deposits                                              | 0 <                 | <u>- ()</u>   | 2                                      | 3                                  |
| 8. Headcuts                                                              | 0                   | 1             | (2)                                    | 3                                  |
| 9. Grade control                                                         | 0                   | (0.5)         | 1                                      | 1.5                                |
| 10. Natural valley                                                       | 0                   | 0.5           | (1)                                    | 1.5                                |
| 11. Second or greater order channel                                      |                     | o=0>          | Yes =                                  | = 3                                |
| <sup>a</sup> artificial ditches are not rated; see discussions in manual |                     |               |                                        |                                    |
| B. Hydrology (Subtotal = <u>9.5</u> )                                    |                     |               |                                        |                                    |
| 12. Presence of Baseflow                                                 | 0                   | 1             | (2)                                    | 3                                  |
| 13. Iron oxidizing bacteria                                              | 0                   | 1             | 2                                      | 3                                  |
| 14. Leaf litter                                                          | 1.5                 | 1             | (0.5)                                  |                                    |
| 15. Sediment on plants or debris                                         | 0                   | 0.5>          | 1                                      | 1.5                                |
| 16. Organic debris lines or piles                                        | 0                   | 0.5           | 1                                      | 1.5                                |
| 17. Soil-based evidence of high water table? No = 0 (Yes = 3)            |                     |               |                                        |                                    |
| C. Biology (Subtotal =)                                                  | 1                   |               |                                        | 9999 - 577, A 497 T <sup>444</sup> |
| 18. Fibrous roots in streambed                                           | 32                  | 2             | 1                                      | 0                                  |
| 19. Rooted upland plants in streambed                                    | 35                  | 2.            | 1                                      | 0                                  |
| 20. Macrobenthos (note diversity and abundance)                          | 0                   | (1)           | 2                                      | 3                                  |
| 21. Aquatic Mollusks                                                     |                     | 1             | 2                                      | 3                                  |
| 22. Fish                                                                 | (6)                 | 0.5           | 1                                      | 1.5                                |
| 23. Crayfish                                                             |                     | 0.5           | 1                                      | 1.5                                |
| 24. Amphibians                                                           | 0                   | 0.5           |                                        | 1.5                                |
| 25. Algae                                                                |                     | 0.5           | 1                                      | 1.5                                |
| 26. Wetland plants in streambed                                          | Care I I            | FACW = 0.75   | $\frac{1}{BL = 1.5 \text{ Other = 0}}$ | 1.0                                |
| *perennial streams may also be identified using other methods. S         | See o. 35 of manual | <u> </u>      |                                        | <u></u>                            |
| Notes: Disconnected from UTS                                             | Aud val             | MONA CAM      | atout the                              |                                    |
|                                                                          | - Charles           |               |                                        |                                    |
| Sketch: - Salamander(2)                                                  |                     |               | -privet, 1                             | (Ŧ,                                |
| - (nanefly (+3                                                           |                     |               | COMBRIGA                               | CONNER                             |
|                                                                          |                     |               | alanth                                 | Craff                              |
|                                                                          |                     |               | er dre war                             | 1. Saved so.                       |

## NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                             | NCDWR #:                                                                                                                                           |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONS: Attach a sl                                                | ketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                         |
| and circle the location of the                                           | stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and                                     |
| number all reaches on the atta                                           | ached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions                                        |
| and explanations of requeste                                             | d information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                          |
| NC SAM User Manual for exa                                               | amples of additional measurements that may be relevant.                                                                                            |
| NOTE EVIDENCE OF STREE                                                   | SSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                |
| PROJECT/SITE INFORMATI                                                   | ION:                                                                                                                                               |
| 1. Project name (if any):                                                | Honey Mill 2. Date of evaluation: 09/04/2019                                                                                                       |
| 3. Applicant/owner name:                                                 | NCDMS 4. Assessor name/organization: H. Reed/ Wildlands Eng.                                                                                       |
| 5. County:                                                               | Surry 6. Nearest named water body                                                                                                                  |
| 7. River basin:                                                          | Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                       |
| 8. Site coordinates (decimal o                                           | legrees, at lower end of assessment reach): 36.42603, -80.613574                                                                                   |
| 9. Site number (show on attac                                            | lepth and width can be approximations)<br>ched map): VC R1 10. Length of assessment reach evaluated (feet): 100                                    |
| 11. Channel depth from bed (                                             | in riffle, if present) to top of bank (feet): 1 - 2'                                                                                               |
| 12. Channel width at top of ba                                           | ank (feet): 4 - 6' 13. Is assessment reach a swamp steam? TYes TNo                                                                                 |
| 14. Feature type: Perennia                                               | al flow Intermittent flow ITidal Marsh Stream                                                                                                      |
| STREAM CATEGORY INFO                                                     | RMATION:                                                                                                                                           |
| 15. NC SAM Zone:                                                         | 🗌 Mountains (M) 🛛 Piedmont (P) 🗌 Inner Coastal Plain (I) 🗌 Outer Coastal Plain (O)                                                                 |
|                                                                          |                                                                                                                                                    |
|                                                                          |                                                                                                                                                    |
| 16. Estimated geomorphic                                                 |                                                                                                                                                    |
| valley shape ( <b>skip for</b>                                           |                                                                                                                                                    |
| Tidal Marsh Stream):                                                     | (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)                                                            |
| 17. Watershed size: (skip                                                | □Size 1 (< 0.1 mi <sup>2</sup> )                                                                                                                   |
| for Tidal Marsh Stream)                                                  |                                                                                                                                                    |
| ADDITIONAL INFORMATIO                                                    | N:                                                                                                                                                 |
| 18. Were regulatory considera                                            | ations evaluated? Xes No If Yes, check all that apply to the assessment area.                                                                      |
| Section 10 water                                                         | □Classified Trout Waters □Water Supply Watershed (□I □II □II □IV)                                                                                  |
| Essential Fish Habitat                                                   | IPrimary Nursery Area I High Quality Waters/Outstanding Resource Waters                                                                            |
|                                                                          | y $\Box$ NCDWR Riparian burler fulle in effect $\Box$ Nutrient Sensitive Waters $\Box$ 303(d) List $\Box$ CAMA Area of Environmental Concern (AEC) |
|                                                                          | of a federal and/or state listed protected species within the assessment area                                                                      |
| List species:                                                            |                                                                                                                                                    |
| Designated Critical Hal                                                  | bitat (list species)                                                                                                                               |
| 19. Are additional stream info                                           | rmation/supplementary measurements included in "Notes/Sketch" section or attached? ☐Yes ⊠No                                                        |
|                                                                          |                                                                                                                                                    |
| 1. Channel Water – assess                                                | ment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                |
| A Water throughou                                                        | It assessment reach.                                                                                                                               |
| $\square B$ No now, water in asse                                        | i pools only.<br>essment reach                                                                                                                     |
|                                                                          |                                                                                                                                                    |
| 2. Evidence of Flow Restric                                              | ction – assessment reach metric                                                                                                                    |
| □A At least 10% of                                                       | assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the                               |
| the assessment                                                           | reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal dates, debris jams                                    |
| beaver dams).                                                            |                                                                                                                                                    |
| ⊠B Not A                                                                 |                                                                                                                                                    |
| 3 Feature Pattern - acces                                                | sment reach metric                                                                                                                                 |
| $\Box A$ A majority of the                                               | assessment reach has altered pattern (examples: straightening, modification above or below culvert)                                                |
| $\boxtimes B$ Not A                                                      |                                                                                                                                                    |
| 4 Footure Longitudine De                                                 | ofile accomment reach matric                                                                                                                       |
| <ul> <li>Feature Longitudinal Pro</li> <li>Majority of access</li> </ul> | unie – assessifiem reach metric<br>ssment reach has a substantially altered stream profile (examples: channel down-outting, existing domming, over |
| widening active                                                          | aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these                                         |
| disturbances).                                                           |                                                                                                                                                    |
| ⊠B Not A ′                                                               |                                                                                                                                                    |
| 5. Signs of Active Instabilit                                            | tv – assessment reach metric                                                                                                                       |
| Consider only current in                                                 | nstability, not past events from which the stream has currently recovered. Examples of instability include                                         |
| active bank failure, active                                              | channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                    |
| A < 10% of channe                                                        | el unstable                                                                                                                                        |
| $\square B \qquad 10 \text{ to } 25\% \text{ of channel}$                | annel unstable                                                                                                                                     |

 $\boxtimes C$  > 25% of channel unstable

#### Streamside Area Interaction - streamside area metric 6. Ink (LB) and the Right Bank (RB).

| Conside | er tor | tne | Lett | вar |
|---------|--------|-----|------|-----|
| LB      | RB     |     |      |     |

⊠A ⊡B

ПС

- ⊠A ⊡B Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- ⊟н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- □J Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes 🗌 No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses ΠA (include liverworts, lichens, and algal mats) ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ПС Multiple snags and logs (including lap trees) ĪΩD 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only<br>Driy<br>A C I H D J |  |
|-----------------------------------------------------------------|--|
|-----------------------------------------------------------------|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

#### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - ⊠В Pool-glide section (evaluate 11d)
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND р C ۸

|             | r o Mooo Ma |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rin-ran concrete, etc.) |
|-------------|-------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\boxtimes$ |             |  | Artificial (rip-rap, concrete, etc.)                                                                                                                                                          |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/cravfish/shrimp)
- Damselfly and dragonfly larvae
- Dipterans
- Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Salamanders/tadpoles
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. IR RR

| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| □в | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| B  | RB |
|----|----|
| A  | ΠA |
| ]В | □В |
|    |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- В Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- □C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ΠY
- ΠY Are wetlands present in the streamside area?
- ΜN ΜN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ΠA Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- DD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΞE Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

### 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- Assessment reach relocated to valley edge ΠE
- ΠF None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLBRBLBRB $\boxtimes A$ $\square A$ $\square A$ $\supseteq B$ BBFrom 50 to < 100 feet wide $\square C$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square D$ $\square B$                                                                                                                                                                                                                                                                                                                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         A       A Mature forest         B       B       Non-mature woody vegetation or modified vegetation structure         \C       \C       Herbaceous vegetation with or without a strip of trees < 10 feet wide                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 21. | D       D       Maintained shrubs         E       E       Little or no vegetation         Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|     | Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:         Abuts       < 30 feet         30-50 feet         LB       RB         LA       A         A       A         A       A         B       B         B       B         B       B         B       B         B       B         C       C         C       C         C       C         C       C         C       C         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).         LB       RB         A       A         Medium to high stem density         B       SB         LOW stem density         C       No wooded riparian buffer or predominantly herbaceous species or bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         LB       RB         A       A         The total length of buffer breaks is < 25 percent.         B       B         The total length of buffer breaks is between 25 and 50 percent.         C       The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         A       A         Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     | <ul> <li>With non-native invasive species absent or sparse.</li> <li>✓B</li> <li>✓B</li> <li>✓B</li> <li>✓B</li> <li>✓C</li> <li></li></ul> |
| 25. | stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.<br><b>Conductivity – assessment reach metric (skip for all Coastal Plain streams)</b><br>25aYesNoWas conductivity measurement recorded?<br>If No, select one of the following reasonsNo WaterOther:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|     | 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square A < 46$ $\square B = 46$ to < 67 $\square C = 67$ to < 79 $\square D = 79$ to < 230 $\square E \ge 230$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Notes/Sketch:

### Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name     | Honey Mill                                   | Date of Assessmen       | t 09/04/2019 | )<br>Vildlanda Eng |
|----------------------|----------------------------------------------|-------------------------|--------------|--------------------|
| Silean Calegory      | Stream Category Pb2 Assessor Name/Organizati |                         |              | vilularius Eriy.   |
| Notes of Field Asse  | ssment Form (V/N)                            |                         | NO           |                    |
| Presence of regulat  | ory considerations (Y/N)                     |                         | YES          |                    |
| Additional stream in | formation/supplementary measur               | rements included (Y/N)  | NO           |                    |
| NC SAM feature typ   | e (perennial, intermittent, Tidal M          | larsh Stream)           | Perennial    | _                  |
|                      | - (F , , ,                                   |                         |              |                    |
|                      |                                              |                         | USACE/       | NCDWR              |
|                      | Function Class Rating Summ                   | nary A                  | All Streams  | Intermittent       |
|                      | (1) Hydrology                                |                         | LOW          |                    |
|                      | (2) Baseflow                                 |                         | HIGH         |                    |
|                      | (2) Flood Flow                               |                         | LOW          |                    |
|                      | (3) Streamside Are                           | ea Attenuation          | LOW          |                    |
|                      | (4) Floodpla                                 | in Access               | HIGH         |                    |
|                      | (4) Wooded                                   | Riparian Buffer         | LOW          |                    |
|                      | (4) Microtop                                 | ography                 | NA           |                    |
|                      | (3) Stream Stabilit                          | у                       | MEDIUM       |                    |
|                      | (4) Channel                                  | Stability               | LOW          |                    |
|                      | (4) Sedimer                                  | nt Transport            | HIGH         |                    |
|                      | (4) Stream (                                 | Geomorphology           | HIGH         |                    |
|                      | (2) Stream/Intertid                          | al Zone Interaction     | NA           |                    |
|                      | (2) Longitudinal Tid                         | al Flow                 | NA           |                    |
|                      | (2) Tidal Marsh Stre                         | eam Stability           | NA           |                    |
|                      | (3) Tidal Mar                                | sh Channel Stability    | NA           |                    |
|                      | (3) Tidal Mar                                | sh Stream Geomorphology | NA           |                    |
|                      | (1) Water Quality                            |                         | MEDIUM       |                    |
|                      | (2) Baseflow                                 |                         | HIGH         |                    |
|                      | (2) Streamside Area Veo                      | etation                 | LOW          |                    |
|                      | (3) Upland Polluta                           | nt Filtration           | LOW          |                    |
|                      | (3) Thermoregulat                            | ion                     | MEDIUM       |                    |
|                      | (2) Indicators of Stressor                   | ·s                      | YES          |                    |
|                      | (2) Aquatic Life Toleranc                    | e                       | HIGH         |                    |
|                      | (2) Intertidal Zone Filtratio                | n                       | NA           |                    |
|                      | (1) Habitat                                  |                         | MEDIUM       |                    |
|                      | (2) In-stream Habitat                        |                         | HIGH         |                    |
|                      | (3) Baseflow                                 |                         | HIGH         |                    |
|                      | (3) Substrate                                |                         | HIGH         |                    |
|                      | (3) Stream Stabilit                          | v                       | LOW          |                    |
|                      | (3) In-stream Habi                           | ,<br>tat                | HIGH         |                    |
|                      | (2) Stream-side Habitat                      | —                       | LOW          |                    |
|                      | (3) Stream-side H                            | abitat                  | LOW          |                    |
|                      | (3) Thermoregulat                            | ion                     | LOW          |                    |
|                      | (2) Tidal Marsh In-stream                    | <br>Habitat             | NA           |                    |
|                      | (3) Flow Restriction                         |                         | NA           |                    |
|                      | (3) Tidal March Str                          |                         | NA           |                    |
|                      | (3) Tidai Marsh Ste<br>(4) Tidai Mar         | sh Channel Stability    | NA           |                    |
|                      | (4) Tidal Mar                                | sh Stream Geomorphology | NA           |                    |
|                      | (3) Tidal Mareh In-e                         | stream Habitat          | NA           |                    |
|                      | (2) Intertidal Zone                          |                         | NA           |                    |
|                      | Overall                                      |                         | MEDIUM       |                    |
|                      |                                              |                         |              |                    |

## NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                     | •                                                              | NCDWR #:                             |                                           |
|------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------|-------------------------------------------|
| INSTRUCTIONS: Attach a sl                                        | ketch of the assessment area and photographs.                  | Attach a copy of the USGS            | 7.5-minute topographic quadrangle,        |
| and circle the location of the                                   | stream reach under evaluation. If multiple stream              | n reaches will be evaluated          | on the same property, identify and        |
| number all reaches on the atta                                   | ached map, and include a separate form for each                | reach. See the NC SAM Us             | ser Manual for detailed descriptions      |
| NC SAM User Manual for exa                                       | a information. Record in the Notes/Sketch sec                  | lion if supplementary measu          | irements were performed. See the          |
| NOTE EVIDENCE OF STREE                                           | SSORS AFFECTING THE ASSESSMENT AREA                            | (do not need to be within            | n the assessment area).                   |
| PROJECT/SITE INFORMATI                                           | ION:                                                           |                                      |                                           |
| 1. Project name (if any):                                        | Honey Mill 2. Dat                                              | e of evaluation: 09/04/2             | 019                                       |
| 3. Applicant/owner name:                                         | NCDMS 4. Ass                                                   | essor name/organization:             | H. Reed/ Wildlands Eng.                   |
| 5. County:<br>7. River basin:                                    | Surry 6. Nea                                                   | arest named water body               | Ararat River                              |
| 8 Site coordinates (decimal o                                    | degrees at lower end of assessment reach):                     | 36 426538 -80 613356                 |                                           |
| STREAM INFORMATION: (d                                           | lepth and width can be approximations)                         |                                      |                                           |
| 9. Site number (show on attac                                    | ched map): VC R2 10. Length                                    | of assessment reach evalua           | ated (feet): 200                          |
| 11. Channel depth from bed (                                     | (in riffle, if present) to top of bank (feet): $2-3$           | U                                    | nable to assess channel depth.            |
| 12. Channel width at top of ba                                   | ank (feet): <u>8 - 10'</u> 13. Is assess                       | ment reach a swamp steam             | ? LYes LNo                                |
|                                                                  | al flow Intermittent flow I I idal Marsh Stream                | 1                                    |                                           |
| 15 NC SAM Zone:                                                  | <b>RMATION:</b> $\square$ Mountains (M) $\square$ Riedmont (R) | Inner Coastal Plain (I)              | Outer Coastal Plain (O)                   |
| T3: NC SAW Zone.                                                 |                                                                |                                      |                                           |
|                                                                  |                                                                |                                      |                                           |
| 16 Estimated geomorphic                                          |                                                                | $\sim$                               | /                                         |
| valley shape (skip for                                           |                                                                | □в                                   |                                           |
| Tidal Marsh Stream):                                             | (more sinuous stream, flatter valley slope)                    | (less sinuous str                    | eam, steeper valley slope)                |
| 17. Watershed size: (skip                                        | □Size 1 (< 0.1 mi <sup>2</sup> )                               | 5 mi <sup>2</sup> ) Size 3 (0.5 to < | 5 mi²)                                    |
| for Tidal Marsh Stream)                                          |                                                                |                                      |                                           |
| ADDITIONAL INFORMATIO                                            |                                                                |                                      |                                           |
| 18. Were regulatory considera                                    | ations evaluated? Xes No If Yes, check al                      | that apply to the assessme           | nt area.                                  |
|                                                                  |                                                                |                                      | Outstanding Resource Waters               |
| Publicly owned propert                                           | NCDWR Riparian buffer rule in effect                           | t Nutrient Sensitive W               | aters                                     |
| Anadromous fish                                                  |                                                                | CAMA Area of Envir                   | onmental Concern (AEC)                    |
| Documented presence                                              | of a federal and/or state listed protected species             | within the assessment area           |                                           |
|                                                                  |                                                                |                                      |                                           |
| 19 Are additional stream info                                    | bitat (IISt species)                                           | n "Notes/Sketch" section or          | attached? □Yes ⊠No                        |
|                                                                  | indicinisupplementary measurements included                    |                                      |                                           |
| 1. Channel Water – assess                                        | ment reach metric (skip for Size 1 streams an                  | d Tidal Marsh Streams)               |                                           |
| A Water throughou                                                | ut assessment reach.                                           |                                      |                                           |
| $\square B$ No now, water in asse                                | essment reach.                                                 |                                      |                                           |
| 2 Evidence of Flow Bootri                                        |                                                                |                                      |                                           |
| 2. Evidence of Flow Restric                                      | ction – assessment reach metric                                | l sequence is severely affe          | sted by a flow restriction or fill to the |
| point of obstruct                                                | ting flow or a channel choked with aquatic macro               | phytes or ponded water or            | impoundment on flood or ebb within        |
| the assessment                                                   | reach (examples: undersized or perched culvert                 | s, causeways that constrict          | the channel, tidal gates, debris jams,    |
| beaver dams).                                                    |                                                                |                                      |                                           |
|                                                                  |                                                                |                                      |                                           |
| 3. Feature Pattern – assess                                      | sment reach metric                                             |                                      |                                           |
|                                                                  | e assessment reach has altered pattern (examples               | s: straigntening, modification       | above or below culvert).                  |
|                                                                  |                                                                |                                      |                                           |
| 4. Feature Longitudinal Pro                                      | ofile – assessment reach metric                                | vrofilo (overnless, shannel s        | lown outting ovicting domming over        |
| widening active                                                  | e aggradation, dredging, and excavation where a                | appropriate channel profile          | has not reformed from any of these        |
| disturbances).                                                   |                                                                |                                      | internet for any of those                 |
| B Not A                                                          |                                                                |                                      |                                           |
| 5. Signs of Active Instabilit                                    | ty – assessment reach metric                                   |                                      |                                           |
| Consider only current in                                         | nstability, not past events from which the str                 | eam has currently recove             | red. Examples of instability include      |
| active bank failure, active                                      | channel down-cutting (head-cut), active widening               | , and artificial hardening (su       | ich as concrete, gabion, rip-rap).        |
| $\square A$ < 10% of channel<br>$\square B$ 10 to 25% of channel | ei unstable<br>annel unstable                                  |                                      |                                           |
| $\boxtimes C$ > 25% of channel                                   | el unstable                                                    |                                      |                                           |

#### Streamside Area Interaction - streamside area metric 6. Consider for the Left Bank (LB) and the Right Bank (RB).

| COUSI |    |
|-------|----|
| LB    | RB |
| ΠA    | ΠA |
| ⊠В    | ØВ |

ПС

- Little or no evidence of conditions that adversely affect reference interaction ΠA
- ⊠в Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- ΠJ Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes 🗌 No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses ΠA (include liverworts, lichens, and algal mats) ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ПС Multiple snags and logs (including lap trees) ĪΩD 5% undercut banks and/or root mats and/or roots in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | ]F<br>]G<br>]H<br>]J<br>]K |
|------------------------------------------|----------------------------|
|------------------------------------------|----------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

#### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - ⊠В Pool-glide section (evaluate 11d)
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND р C ۸

|                             | r om ook of the second s |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square \square \boxtimes$ | $\boxtimes$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.)                                                                             |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs
  - Aquatic reptiles
  - Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
  - Beetles
  - Caddisfly larvae (T)
  - Asian clam (Corbicula)
  - Crustacean (isopod/amphipod/cravfish/shrimp)
  - Damselfly and dragonfly larvae
  - Dipterans
  - Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
  - Midges/mosquito larvae
  - Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
  - Mussels/Clams (not Corbicula)
    - Other fish
    - Salamanders/tadpoles Snails

    - Stonefly larvae (P) Tipulid larvae
    - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

1

| LB | RB |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| ⊠В | ⊠Β | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ΠY
  - ΠY Are wetlands present in the streamside area?
- ΜN ΜN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊠в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- DD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΞE Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

#### 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- ΠE Assessment reach relocated to valley edge
- ΠF None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

| 19. | Buffer Width - streamside area metric | (ski | n for | Tidal | Marsh   | Streams |
|-----|---------------------------------------|------|-------|-------|---------|---------|
| 13. | Duffer Width - Streamsfue area metric | (SRI | pior  | riuai | 1111111 | oueams  |

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break           Vegetated         Wo           LB         RB         LB           △A         △A         △A           □B         □B         □B           □C         □C         □C           □D         □D         □D           □E         □E         □E | RB         A       A       ≥ 100 feet wide or extends to the edge of the watershed         B       B       From 50 to < 100 feet wide         C       C       From 30 to < 50 feet wide         D       D       From 10 to < 30 feet wide         E $X = X$ < 10 feet wide or no trees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure           Consider for left           LB         RB           □A         □A           □B         □B           □C         □C           □D         □D           □E         □E                                                                        | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)<br/>bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> <li>Mature forest<br/>Non-mature woody vegetation <u>or</u> modified vegetation structure<br/>Herbaceous vegetation with or without a strip of trees &lt; 10 feet wide<br/>Maintained shrubs<br/>Little or no vegetation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 21. | Buffer Stressors         Check all approp         within 30 feet of s         If none of the fol         Abuts       < 3                                                                                                                                            | a - streamside area metric (skip for Tidal Marsh Streams)         priate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is tream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         lowing stressors occurs on either bank, check here and skip to Metric 22:         0 feet       30-50 feet         RB       LB         A       A         A       A         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B |
| 22. | Stem Density – s         Consider for left         LB       RB         □A       □A         △B       △B         □C       □C                                                                                                                                          | streamside area metric (skip for Tidal Marsh Streams)<br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 23. | Continuity of Ver         Consider whether         LB       RB         ⊠A       △A         □B       □B         □C       □C                                                                                                                                          | getated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 24. | Vegetative Comp<br>Evaluate the dom<br>assessment reach<br>LB RB<br>A A<br>A<br>B B<br>B                                                                                                                                                                            | bosition – streamside area metric (skip for Tidal Marsh Streams)<br>inant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>in habitat.<br>Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,<br>with non-native invasive species absent or sparse.<br>Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native<br>species. This may include communities of weedy native species that develop after clear-cutting or clearing <u>or</u><br>communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or                                                                                                                                                           |
|     | ⊠c ⊠c                                                                                                                                                                                                                                                               | communities missing understory but retaining canopy trees.<br>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 25. | Conductivity – a<br>25a. Yes X<br>If No, select                                                                                                                                                                                                                     | ssessment reach metric (skip for all Coastal Plain streams)<br>No Was conductivity measurement recorded?<br>t one of the following reasons.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|     | 25b. Check the b<br>□A < 46                                                                                                                                                                                                                                         | box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square B$ 46 to < 67 $\square C$ 67 to < 79 $\square D$ 79 to < 230 $\square E$ ≥ 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Notes/Sketch:

### Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                        | Honey Mill                             | Date of Assessmen        | nt 09/04/2019             | 09/04/2019   |  |
|-------------------------------------------------------------------------|----------------------------------------|--------------------------|---------------------------|--------------|--|
| Stream Category                                                         | ategory Pa2 Assessor Name/Organization |                          | n H. Reed/ Wildlands Eng. |              |  |
|                                                                         |                                        |                          |                           |              |  |
| Notes of Field Assessment Form (Y/N)                                    |                                        |                          | NO                        |              |  |
| Presence of regulatory considerations (Y/N)                             |                                        |                          | YES                       |              |  |
| Additional stream information/supplementary measurements included (Y/N) |                                        |                          | NO                        |              |  |
| NC SAM feature type (perennial, intermittent, 1 idal Marsh Stream)      |                                        |                          | Perenniai                 |              |  |
|                                                                         |                                        |                          |                           |              |  |
|                                                                         | Function Class Rating Sumn             | nary                     | All Streams               | Intermittent |  |
| (1) Hydrology<br>(2) Baseflow                                           |                                        |                          | LOW                       |              |  |
|                                                                         |                                        |                          | HIGH                      |              |  |
|                                                                         | (2) Flood Flow                         |                          | LOW                       |              |  |
| (3) Streamside Area Attenuation                                         |                                        |                          | LOW                       |              |  |
|                                                                         | (4) Floodpla                           | in Access                | MEDIUM                    |              |  |
|                                                                         | (4) Wooded                             |                          | LOW                       |              |  |
|                                                                         | (4) Microtor                           | ography                  | LOW                       |              |  |
|                                                                         | (3) Stream Stability                   |                          | MEDIUM                    |              |  |
|                                                                         | (4) Channel                            |                          | LOW                       |              |  |
|                                                                         | (4) Sedimer                            |                          | HIGH                      |              |  |
|                                                                         | (4) Stream                             | Geomorphology            | HIGH                      |              |  |
|                                                                         | (2) Stream/Intertid                    | al Zone Interaction      | NA                        |              |  |
|                                                                         | (2) Longitudinal Tic                   | al Flow                  | NA                        |              |  |
|                                                                         | (2) Tidal Marsh Str                    | eam Stability            | NA                        |              |  |
|                                                                         | (2) Tidal Malon Od                     | rsh Channel Stability    | NA                        |              |  |
|                                                                         | (3) Tidal Ma                           | rsh Stream Geomorphology | NA                        |              |  |
|                                                                         | (1) Water Quality                      | en eu cam cecino prology | MEDIUM                    |              |  |
|                                                                         | (2) Baseflow                           | —                        | HIGH                      |              |  |
|                                                                         | (2) Streamside Area Ver                | metation                 | LOW                       |              |  |
|                                                                         | (2) Upland Polluta                     | nt Filtration            |                           |              |  |
|                                                                         | (3) Thermoregulat                      | ion                      | MEDIUM                    |              |  |
|                                                                         | (2) Indicators of Stresso              |                          | YES                       |              |  |
|                                                                         | (2) Aquatic Life Tolerand              |                          | HIGH                      |              |  |
|                                                                         | (2) Intertidal Zone Filtratio          | n                        | NA                        |              |  |
|                                                                         | (1) Habitat                            |                          |                           |              |  |
|                                                                         | (1) In-stream Habitat                  | —                        | HIGH                      |              |  |
|                                                                         | (2) In curcan Habitat                  | —                        | HIGH                      |              |  |
|                                                                         | (3) Substrate                          |                          | HIGH                      |              |  |
|                                                                         | (3) Stream Stabilit                    |                          | LOW                       |              |  |
|                                                                         | (3) In-stream Hab                      | itat                     | HIGH                      |              |  |
|                                                                         | (2) Stream-side Habitat                |                          | LOW                       |              |  |
|                                                                         | (3) Stream-side H                      | abitat                   | LOW                       |              |  |
|                                                                         | (3) Thermoregulat                      | ion                      | LOW                       |              |  |
|                                                                         | (2) Tidal Marsh In-stream              | <br>Habitat              | NA                        |              |  |
|                                                                         | (3) Flow Restriction                   | ·                        | NA                        |              |  |
|                                                                         | (3) Tidal March Str                    | eam Stability            | NA                        |              |  |
|                                                                         | (3) Tidai Maish Su<br>(4) Tidal Mai    | rsh Channel Stability    | NA                        |              |  |
|                                                                         |                                        | rsh Stream Geomorphology | NA                        |              |  |
|                                                                         | (3) Tidal Mareh In-                    | stream Habitat           | NA                        |              |  |
|                                                                         | (2) Intertidal Zone                    |                          | NA                        |              |  |
|                                                                         | Overall                                |                          | MEDIUM                    |              |  |
|                                                                         |                                        |                          |                           |              |  |

## NC SAM FIELD ASSESSMENT RESULTS

| UDAUE AID #: NUDWK #:<br>INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USCS 7.5 minute tenegraphic subdrandle                                                             |       |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--|--|--|--|
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the some present, identify and                                                                           |       |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and number all reaches are the NC SAM User Manual for detailed descriptions. |       |  |  |  |  |
| and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                                                                  |       |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant                                                                                                                                        |       |  |  |  |  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                               |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                              |       |  |  |  |  |
| Applicant/output fame (if any).     Holley Ivini     Applicant/output fame, ICDMS     Applicant/output fame, ICDMS     Applicant/output fame, ICDMS                                                                    |       |  |  |  |  |
| 5. Applicativownet name. NCDWS 4. Assessor name/organization. K. Suggs/ Wildiarius Eng.                                                                                                                                |       |  |  |  |  |
| 5. County. Sully 6. Nearest named water body                                                                                                                                                                           |       |  |  |  |  |
| 7. Rivel Dasin. Flaukin Oil USGS 7.5-Initiate quad. Atalat Rivel                                                                                                                                                       |       |  |  |  |  |
| 8. Site coordinates (decimal degrees, at lower end of assessment reach): <u>36.429563, -80.61098</u>                                                                                                                   |       |  |  |  |  |
| 9. Site number (show on attached map): VC R3 10. Length of assessment reach evaluated (feet): 1,500                                                                                                                    |       |  |  |  |  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): <u>3-6'</u> Unable to assess channel depth.                                                                                                  |       |  |  |  |  |
| 12. Channel width at top of bank (feet): 10' 13. Is assessment reach a swamp steam? Yes No                                                                                                                             |       |  |  |  |  |
| 14. Feature type: 	Perennial flow 	Intermittent flow 	Tidal Marsh Stream                                                                                                                                               |       |  |  |  |  |
| STREAM CATEGORY INFORMATION:                                                                                                                                                                                           |       |  |  |  |  |
| 15. NC SAM Zone: 🗌 Mountains (M) 🖾 Piedmont (P) 🗌 Inner Coastal Plain (I) 🗌 Outer Coastal Plain (O)                                                                                                                    |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| 16. Estimated geomorphic                                                                                                                                                                                               |       |  |  |  |  |
| valley shape (skip for                                                                                                                                                                                                 |       |  |  |  |  |
| Tidal Marsh Stream):(more sinuous stream, flatter valley slope)(less sinuous stream, steeper valley slope)                                                                                                             |       |  |  |  |  |
| 17. Watershed size: (skip $\Box$ Size 1 (< 0.1 mi <sup>2</sup> ) $\Box$ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) $\Box$ Size 3 (0.5 to < 5 mi <sup>2</sup> ) $\Box$ Size 4 (≥ 5 mi <sup>2</sup> )                        |       |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                                                                                                |       |  |  |  |  |
| ADDITIONAL INFORMATION:                                                                                                                                                                                                |       |  |  |  |  |
| 18. Were regulatory considerations evaluated? Xes No If Yes, check all that apply to the assessment area.                                                                                                              |       |  |  |  |  |
| Section 10 water Classified Trout Waters Water Supply Watershed (                                                                                                                                                      | ∨)    |  |  |  |  |
| Essential Fish Habitat Primary Nursery Area High Quality Waters/Outstanding Resource Waters                                                                                                                            |       |  |  |  |  |
| □Publicly owned property □NCDWR Riparian buffer rule in effect □Nutrient Sensitive Waters                                                                                                                              |       |  |  |  |  |
| Anadromous fish 303(d) List CAMA Area of Environmental Concern (AEC)                                                                                                                                                   |       |  |  |  |  |
| Documented presence of a federal and/or state listed protected species within the assessment area.                                                                                                                     |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                                                             |       |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached?                                                                                                       |       |  |  |  |  |
| 1 Channel Water – assessment reach metric (skin for Size 1 streams and Tidal Marsh Streams)                                                                                                                            |       |  |  |  |  |
| $\square$ Water throughout assessment reach                                                                                                                                                                            |       |  |  |  |  |
| B No flow water in pools only                                                                                                                                                                                          |       |  |  |  |  |
| $\Box$ C No water in assessment reach.                                                                                                                                                                                 |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                                                              |       |  |  |  |  |
| At least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the                                                                                   |       |  |  |  |  |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal dates, debris iams                                                                                         |       |  |  |  |  |
| beaver dams).                                                                                                                                                                                                          | ,ano, |  |  |  |  |
| ⊠B Not A ′                                                                                                                                                                                                             |       |  |  |  |  |
| 2 Facture Battern concoment reach matric                                                                                                                                                                               |       |  |  |  |  |
| <ul> <li>realure railern - assessment reach metric</li> <li>A mojority of the accomment reach has altered pattern (avamples) straightening, medification shows as helew subject)</li> </ul>                            |       |  |  |  |  |
| □A A majority of the assessment reach has altered pattern (examples: straightening, modification above of below culvert).                                                                                              |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| 4. Feature Longitudinal Profile – assessment reach metric                                                                                                                                                              |       |  |  |  |  |
| A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over                                                                                      |       |  |  |  |  |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these                                                                                            |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                               |       |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include                                                                                      |       |  |  |  |  |
| active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                                                            |       |  |  |  |  |
| □A < 10% of channel unstable                                                                                                                                                                                           |       |  |  |  |  |
|                                                                                                                                                                                                                        |       |  |  |  |  |

 $\boxtimes C$  > 25% of channel unstable
#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| COUSI |    |
|-------|----|
| LB    | RB |
| ΠA    | ΠA |
| ⊠В    | ØВ |

ПС

- A Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- C Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather - watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 
Yes 
No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- □A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
   □⊠B Multiple sticks and/or leaf packs and/or emergent vegetation
   □⊠C Multiple snags and logs (including lap trees)
   □∑0 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | _F<br>_G<br>_H<br>_JK |
|------------------------------------------|-----------------------|
|------------------------------------------|-----------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

|  |  |  |  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.) |
|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

11d. Tyes Two Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. XYes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs
  - Aquatic reptiles
  - Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
  - Beetles
  - Caddisfly larvae (T)
  - Asian clam (Corbicula)
  - Crustacean (isopod/amphipod/cravfish/shrimp)
  - Damselfly and dragonfly larvae
    - ⊠Dipterans
    - Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
    - Midges/mosquito larvae
    - Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
  - Mussels/Clams (not Corbicula)
    - Other fish
    - Salamanders/tadpoles Snails

    - Stonefly larvae (P) Tipulid larvae
    - Worms/leeches

### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

1

| LB | RB |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ⊠Α | ΜA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| □в | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- DD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΞE Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- ΠE Assessment reach relocated to valley edge
- ⊠F None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠В Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLBRBLBRB $\boxtimes A$ $\square A$ $\square A$ $\supseteq B$ $\square B$ $\square B$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square D$ $\square B$ $\square B$ $\square C$ |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         A       A         Mature forest         B       B         Non-mature woody vegetation or modified vegetation structure         C       C         Herbaceous vegetation with or without a strip of trees < 10 feet wide         D       D         Maintained shrubs         E       E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 21. | Buffer Stressors - streamside area metric (skip for Tidal Marsh Streams)         Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:         Abuts       < 30 feet         30-50 feet         LB       RB         LB       RB         LB       B         B       B         B       B         B       B         B       B         B       B         B       B         C       C         C       C         C       C         C       C         C       D         D       D         D       D         D       D         D       D         B       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D                                                                                                                                                                                                                                                                                                                                      |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).         LB       RB         A       A         Medium to high stem density         B       B         LOW stem density         C       XC         No wooded riparian buffer or predominantly herbaceous species or bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         LB       RB         A       A         The total length of buffer breaks is < 25 percent.         B       B         The total length of buffer breaks is between 25 and 50 percent.         C       C         The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         A       A         Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         XIB       B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     | <ul> <li>Solution indicates distributed in terms of species diversity of proportions, but is start argery composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.</li> <li>□C IC IC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 25. | Conductivity – assessment reach metric (skip for all Coastal Plain streams)         25a.       Yes       No       Was conductivity measurement recorded?         If No, select one of the following reasons.       No       Water       Other:         25b.       Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name     | Honey Mill                                 | Date of Assessment 09/04/2019         |                              | )            |
|----------------------|--------------------------------------------|---------------------------------------|------------------------------|--------------|
| Stream Category      | Stream Category Pa3 Assessor Name/Organiza |                                       | ion K. Suggs/ Wildlands Eng. |              |
|                      |                                            |                                       |                              |              |
| Notes of Field Asses | ssment Form (Y/N)                          |                                       | NO                           |              |
| Presence of regulate | ory considerations (Y/N)                   |                                       | YES                          |              |
| Additional stream in | formation/supplementary measu              | rements included (Y/N)                | NO                           |              |
| NC SAM feature typ   | e (perennial, intermittent, Tidal M        | larsh Stream)                         | Perennial                    |              |
|                      |                                            |                                       |                              |              |
|                      | Function Close Detine Summ                 |                                       | USACE/                       | NCDWR        |
|                      | (1) Hydrology                              | lary A                                |                              | Intermittent |
|                      | (1) Hydrology<br>(2) Baseflow              |                                       |                              |              |
|                      | (2) Elocal Elow                            |                                       |                              |              |
|                      | (2) Flood Flow                             |                                       |                              |              |
|                      | (3) Streamside Are                         |                                       |                              |              |
|                      | (4) Floodpla                               | Dispring Duffer                       |                              |              |
|                      | (4) Wooded                                 |                                       |                              |              |
|                      | (4) Microlop                               | ograpny                               |                              |              |
|                      | (3) Stream Stabilit                        | y                                     | MEDIUM                       |              |
|                      | (4) Channel                                |                                       | LOW                          |              |
|                      | (4) Sedimer                                | t Iransport                           | HIGH                         |              |
|                      | (4) Stream (                               | Jeomorphology                         | HIGH                         |              |
|                      | (2) Stream/Intertid                        | al Zone Interaction                   | NA                           |              |
|                      | (2) Longitudinal Tid                       | al Flow                               | NA                           |              |
|                      | (2) Tidal Marsh Stre                       | eam Stability                         | NA                           |              |
|                      | (3) Tidal Mar                              | sh Channel Stability                  | NA                           |              |
|                      | (3) Tidal Mar                              | sh Stream Geomorphology               | NA                           |              |
|                      | (1) Water Quality                          |                                       | LOW                          |              |
|                      | (2) Baseflow                               |                                       | HIGH                         |              |
|                      | (2) Streamside Area Veg                    | jetation                              | LOW                          |              |
|                      | (3) Upland Polluta                         | nt Filtration                         | LOW                          |              |
|                      | (3) Thermoregulat                          | ion                                   | MEDIUM                       |              |
|                      | (2) Indicators of Stressor                 | rs                                    | YES                          |              |
|                      | (2) Aquatic Life Toleranc                  | e                                     | HIGH                         |              |
|                      | (2) Intertidal Zone Filtratio              | n                                     | NA                           |              |
|                      | (1) Habitat                                |                                       | MEDIUM                       |              |
|                      | (2) In-stream Habitat                      |                                       | HIGH                         |              |
|                      | (3) Baseflow                               |                                       | HIGH                         |              |
|                      | (3) Substrate                              |                                       | HIGH                         |              |
|                      | (3) Stream Stabilit                        | у                                     | LOW                          |              |
|                      | (3) In-stream Habi                         | tat                                   | HIGH                         |              |
|                      | (2) Stream-side Habitat                    |                                       | LOW                          |              |
|                      | (3) Stream-side Ha                         | abitat                                | LOW                          |              |
|                      | (3) Thermoregulat                          | ion                                   | MEDIUM                       |              |
|                      | (2) Tidal Marsh In-stream                  | Habitat                               | NA                           |              |
|                      | (3) Flow Restriction                       | · · · · · · · · · · · · · · · · · · · | NA                           |              |
|                      | (3) Tidal Marsh Stre                       | eam Stability                         | NA                           |              |
|                      | (4) Tidal Mar                              | sh Channel Stability                  | NA                           |              |
|                      | (4) Tidal Mar                              | sh Stream Geomorphology               | NA                           |              |
|                      | (3) Tidal Marsh In-s                       | stream Habitat                        | NA                           |              |
|                      | (2) Intertidal Zone                        |                                       | NA                           |              |
|                      | Overall                                    |                                       | LOW                          |              |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #                                                                                                                                                               |  |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle                                           |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property identify and                                       |  |  |  |  |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions                                           |  |  |  |  |
| and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                              |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant.                                                                                                   |  |  |  |  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                           |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                          |  |  |  |  |
| 1. Project name (if any): Honey Mill 2. Date of evaluation: 09/04/2019                                                                                                             |  |  |  |  |
| 3. Applicant/owner name: NCDMS 4. Assessor name/organization: K. Suggs/ Wildlands Eng.                                                                                             |  |  |  |  |
| 5. County: Surry 6. Nearest named water body                                                                                                                                       |  |  |  |  |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                       |  |  |  |  |
| 8. Site coordinates (decimal degrees, at lower end of assessment reach): 36.432749, -80.606299                                                                                     |  |  |  |  |
| STREAM INFORMATION: (depth and width can be approximations)                                                                                                                        |  |  |  |  |
| 9. Site number (show on attached map): VC R4 10. Length of assessment reach evaluated (feet): 1,880                                                                                |  |  |  |  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): 5'                                                                                                       |  |  |  |  |
| 12. Channel width at top of bank (feet): 15' 13. Is assessment reach a swamp steam? Yes No                                                                                         |  |  |  |  |
| 14. Feature type: 🛛 Perennial flow 🔲 Intermittent flow 🗍 Tidal Marsh Stream                                                                                                        |  |  |  |  |
| STREAM CATEGORY INFORMATION:                                                                                                                                                       |  |  |  |  |
| 15. NC SAM Zone: 🛛 Mountains (M) 🛛 Piedmont (P) 🗌 Inner Coastal Plain (I) 🗌 Outer Coastal Plain (O)                                                                                |  |  |  |  |
|                                                                                                                                                                                    |  |  |  |  |
|                                                                                                                                                                                    |  |  |  |  |
| 16. Estimated geomorphic                                                                                                                                                           |  |  |  |  |
| valley shape (skip for                                                                                                                                                             |  |  |  |  |
| Tidal Marsh Stream):(more sinuous stream, flatter valley slope)(less sinuous stream, steeper valley slope)                                                                         |  |  |  |  |
| 17. Watershed size: <b>(skip</b> ☐ Size 1 (< 0.1 mi <sup>2</sup> ) ☐ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) ⊠ Size 3 (0.5 to < 5 mi <sup>2</sup> ) ☐ Size 4 (≥ 5 mi <sup>2</sup> ) |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                                                            |  |  |  |  |
| ADDITIONAL INFORMATION:                                                                                                                                                            |  |  |  |  |
| 18. Were regulatory considerations evaluated? 🛛 Yes □No If Yes, check all that apply to the assessment area.                                                                       |  |  |  |  |
| □Section 10 water       □Classified Trout Waters       □Water Supply Watershed (□I □II □III □III □IV □V)                                                                           |  |  |  |  |
| LEssential Fish Habitat                                                                                                                                                            |  |  |  |  |
| Publicly owned property     INCDWR Riparian buffer rule in effect     INutrient Sensitive Waters                                                                                   |  |  |  |  |
| □ Anadromous tish □ 303(d) List □ CAMA Area of Environmental Concern (AEC)                                                                                                         |  |  |  |  |
| List species.                                                                                                                                                                      |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                         |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached?                                                                   |  |  |  |  |
|                                                                                                                                                                                    |  |  |  |  |
| 1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                       |  |  |  |  |
| A Water throughout assessment reach.                                                                                                                                               |  |  |  |  |
| B No flow, water in pools only.                                                                                                                                                    |  |  |  |  |
| □C No water in assessment reach.                                                                                                                                                   |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                          |  |  |  |  |
| At least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the                                               |  |  |  |  |
| point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb with                                                         |  |  |  |  |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jam                                                      |  |  |  |  |
| Deaver dams).                                                                                                                                                                      |  |  |  |  |
|                                                                                                                                                                                    |  |  |  |  |
| 3. Feature Pattern – assessment reach metric                                                                                                                                       |  |  |  |  |
| A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                             |  |  |  |  |
| ⊠B Not A                                                                                                                                                                           |  |  |  |  |
| 4. Feature Longitudinal Profile – assessment reach metric                                                                                                                          |  |  |  |  |
| A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, ov                                                    |  |  |  |  |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of the                                                          |  |  |  |  |
| disturbances).<br>∑ID Not A                                                                                                                                                        |  |  |  |  |
| KIR NOT A                                                                                                                                                                          |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                           |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include                                                  |  |  |  |  |
| active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                        |  |  |  |  |
| □A < 10% of channel unstable                                                                                                                                                       |  |  |  |  |
|                                                                                                                                                                                    |  |  |  |  |

C > 25% of channel unstable

#### Streamside Area Interaction - streamside area metric 6. k (RB).

| Consi | der for th | e Left Bank | (LB) and | the Right | Ban |
|-------|------------|-------------|----------|-----------|-----|
| LB    | RB         |             |          | _         |     |

- ⊠A ⊡B Little or no evidence of conditions that adversely affect reference interaction
  - Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

⊠A ⊡B

ПС

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- Πн Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- □J Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🗌 Yes ⊠No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses  $\square A$ (include liverworts, lichens, and algal mats) ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ⊠C Multiple snags and logs (including lap trees) ØD 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only<br>Marsh Ctreams |
|-----------------------------------------------------------|
|-----------------------------------------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 🛛 Yes No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - ⊠В Pool-glide section (evaluate 11d)
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND р C ۸

|           | r |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-----------|---|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square$ |   |  | Artificial (rip-rap, concrete, etc.)                                                                                                                   |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans
  - Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
  - Midges/mosquito larvae
  - Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Salamanders/tadpoles
  - Snails
  - Stonefly larvae (P) Tipulid larvae
  - Worms/leeches

### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

- Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. RB LB
  - ⊠Α ⊠Α Little or no alteration to water storage capacity over a majority of the streamside area ⊡в ⊡в Moderate alteration to water storage capacity over a majority of the streamside area ПС Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в ⊡в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- ΠF None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- Assessment reach relocated to valley edge ΠE
- ⊠F None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ΠВ Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLBRBLBRB $\square$ A $\square$ A $\square$ A $\supseteq$ BBBFrom 50 to < 100 feet wide $\square$ C $\square$ C $\square$ C $\square$ C $\square$ CFrom 30 to < 50 feet wide $\square$ D $\square$ D $\square$ D $\square$ From 10 to < 30 feet wide $\square$ E $\square$ E $\square$ E $\square$ C $\square$ C                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         △A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs                                                                                                                                                                                                                                                                                                                                                |
| 21. | □ E       □ E       Little or no vegetation         Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)         Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:         Abuts       < 30 feet       30-50 feet         LB       RB       LB       RB         □ A       □ A       □ A       □ A         B       □ B       □ B       □ B         □ C       □ C       □ C       □ C         □ D       □ D       □ D       □ D         □ D       □ D       □ D       □ Pasture (active livestock use) |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).         LB       RB         \[\AA] A       Medium to high stem density         \[\BA] B       Low stem density         \[\CAC] C       No wooded riparian buffer or predominantly herbaceous species or bare ground                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         LB       RB         △A       △A         The total length of buffer breaks is < 25 percent.         □B       □B         □C       □C         The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                               |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       □A         WB       WB         WB       WB         Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or                                                                                                                                                                                                                        |
| 25  | <ul> <li>communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.</li> <li>C C</li> <li>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.</li> </ul>                                                                                                                                                                                                                       |
| 20. | 25aYes ⊠No Was conductivity measurement recorded?<br>If No, select one of the following reasonsNo Water _Other:<br>25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>A < 46B 46 to < 67C 67 to < 79D 79 to < 230E ≥ 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name     | Honey Mill                               | Date of Assessment 09/     |                          | 9/04/2019    |  |
|----------------------|------------------------------------------|----------------------------|--------------------------|--------------|--|
| Stream Category      | Pa3                                      | Assessor Name/Organization | K. Suggs/ Wildlands Eng. |              |  |
|                      |                                          |                            |                          |              |  |
| Notes of Field Asses | ssment Form (Y/N)                        |                            | NO                       |              |  |
| Presence of regulate | ory considerations (Y/N)                 |                            | YES                      |              |  |
| Additional stream in | formation/supplementary measu            | rements included (Y/N)     | NO                       |              |  |
| NC SAM feature typ   | e (perennial, intermittent, Tidal I      | Marsh Stream)              | Perennial                |              |  |
|                      |                                          |                            |                          |              |  |
|                      | Function Class Rating Summ               | narv A                     | USACE/                   | Intermittent |  |
|                      | (1) Hydrology                            |                            | HIGH                     |              |  |
|                      | (2) Baseflow                             |                            | HIGH                     |              |  |
|                      | (2) Flood Flow                           |                            | HIGH                     |              |  |
|                      | (3) Streamside Ar                        | ea Attenuation             | HIGH                     |              |  |
|                      | (4) Floodpla                             | ain Access                 | HIGH                     |              |  |
|                      | (1) 1 100 dp.                            | Riparian Buffer            | HIGH                     |              |  |
|                      | (4) Microtor                             | pography                   | LOW                      |              |  |
|                      | (3) Stream Stabili                       | tv                         | HIGH                     |              |  |
|                      | (d) Channe                               | l Stability                | MEDIUM                   |              |  |
|                      | (1) Sedime                               | nt Transport               | HIGH                     |              |  |
|                      | (4) Stream                               | Geomorphology              | HIGH                     |              |  |
|                      | (2) Stream/Intertic                      | al Zone Interaction        | NA                       |              |  |
|                      | (2) Longitudinal Tic                     |                            | NA                       |              |  |
|                      | (2) Tidal March Str                      | oom Stability              | NA                       |              |  |
|                      | (2) Tidal Marsh Str<br>(3) Tidal Ma      |                            |                          |              |  |
|                      | (3) Tidal Ma                             |                            |                          |              |  |
|                      | (3) Tidai Ma                             | Isit Stream Geomorphology  |                          |              |  |
|                      | (1) Water Quality                        |                            |                          |              |  |
|                      | (2) Streemeide Area Ver                  |                            |                          |              |  |
|                      | (2) Streamside Area Ve                   | nt Eiltration              |                          |              |  |
|                      | (3) Optand Politika<br>(2) Thermoregular |                            |                          |              |  |
|                      | (3) Indianters of Strange                |                            |                          |              |  |
|                      | (2) Aquatia Life Telever                 | <u> </u>                   | TES                      |              |  |
|                      | (2) Aqualic Life Tolerand                |                            | HIGH                     |              |  |
|                      | (2) Intertidal Zone Filtratio            | 911<br>                    |                          |              |  |
|                      | (1) Habitat                              |                            | HIGH                     |              |  |
|                      |                                          |                            |                          |              |  |
|                      |                                          |                            |                          |              |  |
|                      |                                          |                            |                          |              |  |
|                      |                                          | Ly                         |                          |              |  |
|                      | (3) In-stream Hab                        |                            |                          |              |  |
|                      |                                          |                            |                          |              |  |
|                      | (3) Stream-side H                        |                            | HIGH                     |              |  |
|                      | (3) I nermoregulai                       |                            | HIGH                     |              |  |
|                      | (∠) i Idai Marsh In-stream               |                            | NA                       |              |  |
|                      | (3) Flow Restriction                     | ו<br>                      | NA                       |              |  |
|                      | (3) Tidal Marsh Str                      | eam Stability              | NA                       |              |  |
|                      | (4) Tidal Ma                             | rsn Channel Stability      | NA                       |              |  |
|                      | (4) Tidal Ma                             | rsh Stream Geomorphology   | NA                       |              |  |
|                      | (3) Tidal Marsh In-                      | stream Habitat             | NA                       |              |  |
|                      | (2) Intertidal Zone                      |                            | NA                       |              |  |
|                      | Overall                                  |                            | HIGH                     |              |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #:                                                                                                                                                                                                                                 |       |  |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                                                                                             |       |  |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify a                                                                                                           | and   |  |  |  |  |  |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed description                                                                                                               | ons   |  |  |  |  |  |
| and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See                                                                                                                     | the   |  |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant.                                                                                                                                                                      |       |  |  |  |  |  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                              |       |  |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                                                             |       |  |  |  |  |  |
| 1. Project name (if any):       Honey Mill       2. Date of evaluation:       09/04/2019                                                                                                                                                              |       |  |  |  |  |  |
| 3. Applicant/owner name: NCDMS 4. Assessor name/organization: H. Reed/ Wildlands Eng.                                                                                                                                                                 |       |  |  |  |  |  |
| 5. County: Surry 6. Nearest named water body                                                                                                                                                                                                          |       |  |  |  |  |  |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                          |       |  |  |  |  |  |
| 8. Site coordinates (decimal degrees, at lower end of assessment reach): <u>36.426039, -80.613595</u>                                                                                                                                                 |       |  |  |  |  |  |
| STREAM INFORMATION: (depth and width can be approximations)                                                                                                                                                                                           |       |  |  |  |  |  |
| 9. Site number (show on allached map). Unit 10. Length of assessment reach evaluated (reet). 150                                                                                                                                                      |       |  |  |  |  |  |
| 11. Channel deput from bed (in fine, if present) to top of bank (reet). $2-3$ $\Box$ of bank (feet):                                                                                                                                                  |       |  |  |  |  |  |
| 12. Channel width at top of bank (leet). $0 - 0$ 15. Is assessment reach a swamp steam? These two 14. Feature type: Meanning flow Intermittent flow ITidal Marsh Stream                                                                               |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
| 15. NC SAM Zone: $\square$ Mountains (M) $\square$ Piedmont (P) $\square$ Inner Coastal Plain (I) $\square$ Outer Coastal Plain (O)                                                                                                                   |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
| valley shape (skip for                                                                                                                                                                                                                                |       |  |  |  |  |  |
| Tidal Marsh Stream): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)                                                                                                                                          |       |  |  |  |  |  |
| 17. Watershed size: (skip $\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5 mi <sup>2</sup> ) $\square$ Size 4 (> 5 mi <sup>2</sup> )                                           |       |  |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                                                                                                                               |       |  |  |  |  |  |
| ADDITIONAL INFORMATION:                                                                                                                                                                                                                               |       |  |  |  |  |  |
| 18. Were regulatory considerations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.                                                                                                                                           |       |  |  |  |  |  |
| Section 10 water Classified Trout Waters Water Supply Watershed (                                                                                                                                                                                     | √)    |  |  |  |  |  |
| Essential Fish Habitat                                                                                                                                                                                                                                |       |  |  |  |  |  |
| □ Publicly owned property □ NCDWR Riparian buffer rule in effect □ Nutrient Sensitive Waters                                                                                                                                                          |       |  |  |  |  |  |
| Anadromous fish U303(d) List UCAMA Area of Environmental Concern (AEC)                                                                                                                                                                                |       |  |  |  |  |  |
| List species:                                                                                                                                                                                                                                         |       |  |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                                                                                            |       |  |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached?                                                                                                                                      |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
| 1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                          |       |  |  |  |  |  |
| ⊠A Water throughout assessment reach.                                                                                                                                                                                                                 |       |  |  |  |  |  |
| UB NO TIOW, WATER IN POOLS ONLY.                                                                                                                                                                                                                      |       |  |  |  |  |  |
|                                                                                                                                                                                                                                                       |       |  |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                                                                                             |       |  |  |  |  |  |
| □A At least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to                                                                                                            | o the |  |  |  |  |  |
| point of obstructing now or a channel choked with aquatic macrophytes or ponded water or impoundment on flood of ebb w<br>the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris i | ams   |  |  |  |  |  |
| beaver dams).                                                                                                                                                                                                                                         | anio, |  |  |  |  |  |
| B Not A                                                                                                                                                                                                                                               |       |  |  |  |  |  |
| 3 Feature Pattern - assessment reach metric                                                                                                                                                                                                           |       |  |  |  |  |  |
| A majority of the assessment reach has altered pattern (examples: straightening modification above or below culvert)                                                                                                                                  |       |  |  |  |  |  |
| $\square$ B Not A                                                                                                                                                                                                                                     |       |  |  |  |  |  |
| A Fastura Longitudinal Brofile association matrix                                                                                                                                                                                                     |       |  |  |  |  |  |
| Realure Longitudinal FIOHE – assessment reach has a substantially altered stream profile (examples) channel down-cutting, existing domming, or                                                                                                        |       |  |  |  |  |  |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these                                                                                                                           |       |  |  |  |  |  |
| disturbances).                                                                                                                                                                                                                                        |       |  |  |  |  |  |
| B Not A                                                                                                                                                                                                                                               |       |  |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                                                              |       |  |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include                                                                                                                     |       |  |  |  |  |  |
| active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap)                                                                                                            |       |  |  |  |  |  |
| A < 10% of channel unstable                                                                                                                                                                                                                           |       |  |  |  |  |  |
| $\square$ B 10 to 25% of channel unstable                                                                                                                                                                                                             |       |  |  |  |  |  |

 $\boxtimes C$  > 25% of channel unstable

#### Streamside Area Interaction - streamside area metric 6. Consider for the Left Bank (LB) and the Right Bank (RB).

| COUSI |    |
|-------|----|
| LB    | RB |
| ΠA    | ΠA |
| ⊠В    | ØВ |

ПС

- Little or no evidence of conditions that adversely affect reference interaction ΠA
- ⊠в Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- □J Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes 🗌 No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses ΠA (include liverworts, lichens, and algal mats) ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ПС Multiple snags and logs (including lap trees) ĪΩD 5% undercut banks and/or root mats and/or roots in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams |  |  |
|----------------------------------|--|--|
|----------------------------------|--|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - ⊠В Pool-glide section (evaluate 11d)
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND р C ۸

|                     | r om oo on o |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|---------------------|--------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square \boxtimes$ |              |  | Detritus<br>Artificial (rip-rap, concrete, etc.)                                                                                                       |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans Mayfly larvae (E)
- Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Salamanders/tadpoles Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. LB RB

| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ⊠В | ⊠В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ΠY
  - ΠY Are wetlands present in the streamside area?
- ΜN ΜN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ΠA Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- DD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΞE Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- Assessment reach relocated to valley edge ΠE
- ΠF None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.         Vegetated       Wooded         LB       RB       LB       RB $\square A$ $\square A$ $\geq$ 100 feet wide or extends to the edge of the watershed $\square B$ $\square B$ $\square B$ $\square B$ $\square B$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square C$ $\square C$ $\square D$ $\square D$ $\square C$ $\square C$ $\square C$ $\square D$ $\square C$ $\square C$ |  |  |  |  |  |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         A       A         Mature forest       B         B       Non-mature woody vegetation or modified vegetation structure         A       C         B       B         Maintained shrubs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |
| 21. | E       Little or no vegetation         Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)         Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |
|     | Abuts       < 30 feet       30-50 feet         LB       RB       LB       RB         A       A       A       A         A       A       A       A         B       B       B       B         B       B       B       B         C       C       C       C         QD       QD       QD       Pasture (active livestock use)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)<br>Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |
|     | LB RB<br>A A Medium to high stem density<br>B AB Low stem density<br>C DC No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |
|     | LB RB<br>⊠A ⊠A The total length of buffer breaks is < 25 percent.<br>□B □B The total length of buffer breaks is between 25 and 50 percent.<br>□C □C The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |
| 24. | <ul> <li>Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes assessment reach habitat.     </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |
|     | A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |
|     | B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining capapy trees.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |
|     | C C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |
| 25. | Conductivity – assessment reach metric (skip for all Coastal Plain streams)<br>25a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |
|     | 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name Honey Mill |                                     | Date of Assessmen          | 09/04/2019                |              |  |
|-----------------------------|-------------------------------------|----------------------------|---------------------------|--------------|--|
| Stream Category             | Pa2                                 | Assessor Name/Organization | n H. Reed/ Wildlands Eng. |              |  |
|                             |                                     |                            |                           |              |  |
| Notes of Field Asses        | ssment Form (Y/N)                   |                            | NO                        |              |  |
| Presence of regulate        | ory considerations (Y/N)            |                            | YES                       |              |  |
| Additional stream in        | formation/supplementary measu       | rements included (Y/N)     | NO                        |              |  |
| NC SAM feature typ          | e (perennial, intermittent, Tidal N | Perennial                  |                           |              |  |
|                             |                                     |                            |                           |              |  |
|                             | Function Class Pating Summ          | 2217/                      | USACE/                    | NCDWR        |  |
|                             | (1) Hydrology                       |                            |                           | intermittent |  |
|                             | (1) Hydrology<br>(2) Baseflow       | —                          | HIGH                      |              |  |
|                             | (2) Elood Elow                      | —                          |                           |              |  |
|                             | (2) Tiood Tiow<br>(3) Streamside Ar |                            |                           |              |  |
|                             | (3) Streamside Al                   |                            |                           |              |  |
|                             | (4) Floodpla                        | Binorion Buffor            |                           |              |  |
|                             | (4) Wooded                          |                            |                           |              |  |
|                             | (4) Microlop<br>(2) Stream Stabili  |                            |                           |              |  |
|                             | (3) Stream Stabili                  | y                          | LOW                       |              |  |
|                             | (4) Channel                         |                            |                           |              |  |
|                             | (4) Sedimer                         |                            | HIGH                      |              |  |
|                             | (4) Stream                          |                            | LOW                       |              |  |
|                             | (2) Stream/Intertio                 |                            | NA                        |              |  |
|                             | (2) Longitudinal Tic                | lal Flow                   | NA                        |              |  |
|                             | (2) Tidal Marsh Str                 | eam Stability              | NA                        |              |  |
|                             | (3) Iidal Ma                        | rsh Channel Stability      | NA                        |              |  |
|                             | (3) Tidal Ma                        | rsh Stream Geomorphology   | NA                        |              |  |
|                             | (1) Water Quality                   |                            | MEDIUM                    |              |  |
|                             | (2) Baseflow                        |                            | HIGH                      |              |  |
|                             | (2) Streamside Area Veg             | jetation                   | LOW                       |              |  |
|                             | (3) Upland Polluta                  | nt Filtration              | LOW                       |              |  |
|                             | (3) Thermoregulat                   | ion                        | MEDIUM                    |              |  |
|                             | (2) Indicators of Stresso           | rs                         | YES                       |              |  |
|                             | (2) Aquatic Life Tolerand           | .e                         | HIGH                      |              |  |
|                             | (2) Intertidal Zone Filtratio       | n                          | NA                        |              |  |
|                             | (1) Habitat                         |                            | MEDIUM                    |              |  |
|                             | (2) In-stream Habitat               |                            | HIGH                      |              |  |
|                             | (3) Baseflow                        |                            | HIGH                      |              |  |
|                             | (3) Substrate                       |                            | HIGH                      |              |  |
|                             | (3) Stream Stabilit                 | y                          | LOW                       |              |  |
|                             | (3) In-stream Hab                   | itat                       | HIGH                      |              |  |
|                             | (2) Stream-side Habitat             |                            | LOW                       |              |  |
|                             | (3) Stream-side H                   | abitat                     | LOW                       |              |  |
|                             | (3) Thermoregulat                   | ion                        | MEDIUM                    |              |  |
|                             | (2) Tidal Marsh In-stream           | Habitat                    | NA                        |              |  |
|                             | (3) Flow Restriction                | <u> </u>                   | NA                        |              |  |
|                             | (3) Tidal Marsh Str                 | eam Stability              | NA                        |              |  |
|                             | (4) Tidal Ma                        | rsh Channel Stability      | NA                        |              |  |
|                             | (4) Tidal Ma                        | rsh Stream Geomorphology   | NA                        |              |  |
|                             | (3) Tidal Marsh In-s                | stream Habitat             | NA                        |              |  |
|                             | (2) Intertidal Zone                 |                            | NA                        |              |  |
|                             | Overall                             |                            | MEDIUM                    |              |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #:                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                                                                                                                                                                                                                                                               |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and                                                                                                                                                                                                                                                                           |  |  |  |  |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                                                                                                                          |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant.                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
| 1. Project name (if any):       Honey Mill       2. Date of evaluation:       09/04/2019                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| 3. Applicant/owner name: NCDMS 4. Assessor name/organization: H. Reed/ Wildlands Eng.                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| 5. County: Surry 6. Nearest named water body                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
| STREAM INFORMATION: (depth and width can be approximations)                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |
| 9. Site number (show on attached map): UT2A 10. Length of assessment reach evaluated (feet): 200                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): <u>1 - 3'</u> Unable to assess channel depth.                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| 12. Channel width at top of bank (feet): 8 - 10 13. Is assessment reach a swamp steam? Yes No                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 15. NC SAM Zone: Mountains (M) Piedmont (P) Inner Coastal Plain (I) Outer Coastal Plain (O)                                                                                                                                                                                                                                                                                                                             |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 16. Estimated geomorphic                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| valley shape (skip for                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |
| <b>Lidal Marsh Stream</b> ): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)                                                                                                                                                                                                                                                                                                    |  |  |  |  |
| 17. Watershed size: (skip Size 1 (< 0.1 mi <sup>2</sup> ) Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) Size 3 (0.5 to < 5 mi <sup>2</sup> ) Size 4 ( $\geq$ 5 mi <sup>2</sup> )                                                                                                                                                                                                                                               |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 18. Were regulatory considerations evaluated? XYes No If Yes, check all that apply to the assessment area.                                                                                                                                                                                                                                                                                                              |  |  |  |  |
| □Section 10 water □Classified Trout Waters □Water Supply Watershed (□I □II □II □II □V □V)                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
| Essential Fish Habitat                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |
| Publicly owned property INCDWR Riparian buffer rule in effect INutrient Sensitive Waters                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| Documented presence of a federal and/or state listed protected species within the assessment area.                                                                                                                                                                                                                                                                                                                      |  |  |  |  |
| List species:                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached?  Yes  No                                                                                                                                                                                                                                                                                               |  |  |  |  |
| 1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
| $\square$ A Water throughout assessment reach.                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |
| B No flow, water in pools only.                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| C No water in assessment reach.                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
| A t least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the point of obstructing flow or a channel obstruction grant of abstructing flow or a channel obstruction means that are point of abstructing flow or a channel obstruction with a guardian means that are point of a set of the second water or impoundment on fload or obstruction. |  |  |  |  |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams                                                                                                                                                                                                                                                                                          |  |  |  |  |
| beaver dams).                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
| ⊠B Not A                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| 3. Feature Pattern – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
| A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                                                                                                                                                                                                                                                                  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 4. Feature Longitudinal Profile – assessment reach metric                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
| Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these streams and excavation where appropriate channel profile has not reformed from any of these streams and excavation.                                         |  |  |  |  |
| widening, active aggradation, dreuging, and excavation where appropriate channel profile has not reformed from any of these disturbances).                                                                                                                                                                                                                                                                              |  |  |  |  |
| B Not A                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include                                                                                                                                                                                                                                                                                       |  |  |  |  |
| active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                                                                                                                                                                                                                                                             |  |  |  |  |
| $\square A = 10\%$ of channel unstable                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |

C > 25% of channel unstable

#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| CONSIG | ier ior |
|--------|---------|
| LB     | RB      |
| ΠA     | ΠA      |
| ⊠В     | ΜE      |

ПС

- A Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- C Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B <u>Excessive</u> sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather - watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. Yes Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- □A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
   □⊠B Multiple sticks and/or leaf packs and/or emergent vegetation
   □⊠C Multiple snags and logs (including lap trees)
   □∑N 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | _F<br>_G<br>_H<br>_J<br>J<br>K |
|------------------------------------------|--------------------------------|
|------------------------------------------|--------------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

|           | r MMC CMM   |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-----------|-------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square$ | $\boxtimes$ |  | Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.)                                                                             |

11d. Tyes XNo Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - >1 Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.

|   | Adult | t frogs |  |
|---|-------|---------|--|
| _ |       |         |  |

1

 $\Box$ 

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Damselfly and dragonfly larvae
- Dipterans
- Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea*)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

| LB | RB |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| □в | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| B  | RB |
|----|----|
| A  | ΠA |
| ]В | □в |
|    |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- B Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- ЦС Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
- ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ΠA Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- ΠE Assessment reach relocated to valley edge
- ΠF None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- □в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|                                                                                                                                                                                                                                                                                                                                                                          | to the first break.VegetatedWooLBRBLB $\boxtimes A$ $\boxtimes A$ $\boxtimes A$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square E$ $\square E$ $\square E$                                      | bded<br>RB<br>$\boxtimes A \ge 100$ feet wide <u>or</u> extends to the edge of the watershed<br>$\square B$ From 50 to < 100 feet wide<br>$\square C$ From 30 to < 50 feet wide<br>$\square D$ From 10 to < 30 feet wide<br>$\square E < 10$ feet wide <u>or</u> no trees                                                                                                                                              |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| 20.                                                                                                                                                                                                                                                                                                                                                                      | Buffer Structure -<br>Consider for left<br>LB RB<br>□A □A<br>⊠B ⊠B<br>□C □C<br>□D □D                                                                                                                                                                                 | - streamside area metric (skip for Tidal Marsh Streams)<br>bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).<br>Mature forest<br>Non-mature woody vegetation <u>or</u> modified vegetation structure<br>Herbaceous vegetation with or without a strip of trees < 10 feet wide<br>Maintained shrubs                                                                                               |  |  |  |  |
| <ul> <li>Little or no vegetation</li> <li>21. Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not a within 30 feet of stream (&lt; 30 feet), or is between 30 to 50 feet of stream (30-50 feet).</li> </ul> |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          | Abuts< 30                                                                                                                                                                                                                                                            | $O feet$ 30-50 feet         RB       LB       RB $\Box A$ $\Box A$ Row crops $\Box B$ $\Box B$ $\Box B$ $\Box C$ $\Box C$ Pasture (no livestock)/commercial horticulture $\Box D$ $\Box D$ $\Box D$ $\Box D$ $\Box D$ Pasture (active livestock use)                                                                                                                                                                   |  |  |  |  |
| 22.                                                                                                                                                                                                                                                                                                                                                                      | Stem Density – s<br>Consider for left                                                                                                                                                                                                                                | treamside area metric (skip for Tidal Marsh Streams)<br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).                                                                                                                                                                                                                                                                                           |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          | LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                                                                                                                                                                     | Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                          |  |  |  |  |
| 23.                                                                                                                                                                                                                                                                                                                                                                      | Continuity of Veg<br>Consider whether<br>LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                                                                                                                            | etated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                    |  |  |  |  |
| 24.                                                                                                                                                                                                                                                                                                                                                                      | I. Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)<br>Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>assessment reach habitat. I.B. RB |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                      | Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.                                                                                                                                                                                                                                               |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          | ⊠B ⊠B                                                                                                                                                                                                                                                                | Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          | □c □c                                                                                                                                                                                                                                                                | Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                              |  |  |  |  |
| 25.                                                                                                                                                                                                                                                                                                                                                                      | Conductivity – as<br>25a.<br>If No, select                                                                                                                                                                                                                           | sessment reach metric (skip for all Coastal Plain streams) No Was conductivity measurement recorded? one of the following reasons. □No Water □Other:                                                                                                                                                                                                                                                                   |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          | 25b. Check the b<br>□A < 46                                                                                                                                                                                                                                          | ox corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>☐B 46 to < 67                                                                                                                                                                                                                                                                                                              |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                                                                                                                                                                    | Honey Mill                          | Date of Assessment         |           | 9              |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------|-----------|----------------|--|
| Stream Category                                                                                                                                                                                                     | Pb1                                 | Assessor Name/Organization |           | Vildlands Eng. |  |
|                                                                                                                                                                                                                     |                                     |                            |           |                |  |
| Notes of Field Asses                                                                                                                                                                                                | ssment Form (Y/N)                   |                            | NO        |                |  |
| Presence of regulate                                                                                                                                                                                                | ory considerations (Y/N)            |                            | YES       |                |  |
| Additional stream inf                                                                                                                                                                                               | formation/supplementary measu       | irements included (Y/N)    | NO        |                |  |
| NC SAM feature typ                                                                                                                                                                                                  | e (perennial, intermittent, Tidal I | Marsh Stream)              | Perennial |                |  |
|                                                                                                                                                                                                                     |                                     |                            |           |                |  |
|                                                                                                                                                                                                                     | Eurotion Class Pating Sum           | 220                        | USACE/    | NCDWR          |  |
|                                                                                                                                                                                                                     | (1) Hydrology                       | lialy                      | HIGH      | Intermittent   |  |
| (1) Hydrology                                                                                                                                                                                                       |                                     |                            | MEDILIM   |                |  |
|                                                                                                                                                                                                                     | (2) Flood Flow                      | —                          | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) Streamside A                    | ea Attenuation             |           |                |  |
|                                                                                                                                                                                                                     | (3) Streamside A                    |                            |           |                |  |
|                                                                                                                                                                                                                     | (4) Noodor                          |                            |           |                |  |
|                                                                                                                                                                                                                     | (4) Woode                           | nography                   | NA        |                |  |
|                                                                                                                                                                                                                     | (2) Stroom Stabili                  |                            |           |                |  |
|                                                                                                                                                                                                                     | (3) Stream Stabil                   | ly                         |           |                |  |
|                                                                                                                                                                                                                     | (4) Charline                        |                            |           |                |  |
|                                                                                                                                                                                                                     | (4) Sedime                          |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (4) Stream                          | Geomorphology              | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) Stream/Intertio                 |                            | NA        |                |  |
| (2) Longitudinal Tidal Flow<br>(2) Tidal Marsh Stream Stability<br>(3) Tidal Marsh Channel Stability<br>(3) Tidal Marsh Stream Geomorphology<br>(1) Water Quality<br>(2) Baseflow<br>(2) Streamside Area Vegetation |                                     | dal Flow                   | NA        |                |  |
|                                                                                                                                                                                                                     |                                     | NA                         |           |                |  |
|                                                                                                                                                                                                                     |                                     | NA                         |           |                |  |
|                                                                                                                                                                                                                     |                                     | NA                         |           |                |  |
|                                                                                                                                                                                                                     |                                     | MEDIUM                     |           |                |  |
|                                                                                                                                                                                                                     |                                     |                            | MEDIUM    |                |  |
|                                                                                                                                                                                                                     |                                     | getation                   | MEDIUM    |                |  |
|                                                                                                                                                                                                                     | (3) Upland Polluta                  | ant Filtration             | LOW       |                |  |
|                                                                                                                                                                                                                     | (3) Thermoregula                    | tion                       | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) Indicators of Stresso           | ors                        | YES       |                |  |
|                                                                                                                                                                                                                     | (2) Aquatic Life Toleran            |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) Intertidal Zone Filtration      | on                         | NA        |                |  |
|                                                                                                                                                                                                                     | (1) Habitat                         |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) In-stream Habitat               |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (3) Baseflow                        | _                          | MEDIUM    |                |  |
|                                                                                                                                                                                                                     | (3) Substrate                       |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (3) Stream Stabili                  | ty                         | MEDIUM    |                |  |
|                                                                                                                                                                                                                     | (3) In-stream Hab                   | pitat                      | HIGH      |                |  |
|                                                                                                                                                                                                                     | (2) Stream-side Habitat             |                            | HIGH      |                |  |
|                                                                                                                                                                                                                     | (3) Stream-side H                   | labitat                    | HIGH      |                |  |
|                                                                                                                                                                                                                     | (3) Thermoregula                    | tion                       | HIGH      |                |  |
| (2) Tidal Marsh In-stream Habitat<br>(3) Flow Restriction<br>(3) Tidal Marsh Stream Stability                                                                                                                       |                                     | Habitat                    | NA        |                |  |
|                                                                                                                                                                                                                     |                                     | n                          | NA        |                |  |
|                                                                                                                                                                                                                     |                                     | ream Stability             | NA        |                |  |
|                                                                                                                                                                                                                     | (4) Tidal Ma                        | arsh Channel Stability     | NA        |                |  |
|                                                                                                                                                                                                                     | (4) Tidal Ma                        | arsh Stream Geomorphology  | NA        |                |  |
|                                                                                                                                                                                                                     | (3) Tidal Marsh In-                 | stream Habitat             | NA        |                |  |
|                                                                                                                                                                                                                     | (2) Intertidal Zone                 |                            | NA        |                |  |
|                                                                                                                                                                                                                     | Overall                             |                            | HIGH      |                |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #:                                                                                                                                                                                       |      |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                                                   |      |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify an                                                                | nd   |  |  |  |  |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed description                                                                     | าร   |  |  |  |  |
| and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                                                       | ie   |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant.                                                                                                                            |      |  |  |  |  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                    |      |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                   |      |  |  |  |  |
| 1. Project name (if any):    Honey Mill    2. Date of evaluation:    09/04/2019                                                                                                                             |      |  |  |  |  |
| 3. Applicant/owner name: NCDMS 4. Assessor name/organization: H. Reed/ Wildlands Eng.                                                                                                                       |      |  |  |  |  |
| 5. County: Surry 6. Nearest named water body                                                                                                                                                                |      |  |  |  |  |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                |      |  |  |  |  |
| 8. Site coordinates (decimal degrees, at lower end of assessment reach): <u>36.427931, -80.611003</u>                                                                                                       |      |  |  |  |  |
| 9. Site number (show on attached map): UT2 R1 10. Length of assessment reach evaluated (feet): 150                                                                                                          |      |  |  |  |  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): 1 - 2'                                                                                                                            | -    |  |  |  |  |
| 12. Channel width at top of bank (feet): 5 - 8' 13. Is assessment reach a swamp steam? Yes No                                                                                                               |      |  |  |  |  |
| 14. Feature type: ⊠Perennial flow □Intermittent flow □Tidal Marsh Stream                                                                                                                                    |      |  |  |  |  |
| STREAM CATEGORY INFORMATION:                                                                                                                                                                                |      |  |  |  |  |
| 15. NC SAM Zone: 🗌 Mountains (M) 🛛 Piedmont (P) 🗌 Inner Coastal Plain (I) 🗌 Outer Coastal Plain (O)                                                                                                         |      |  |  |  |  |
|                                                                                                                                                                                                             |      |  |  |  |  |
|                                                                                                                                                                                                             |      |  |  |  |  |
| 16. Estimated geomorphic                                                                                                                                                                                    |      |  |  |  |  |
| valley shape (skip for                                                                                                                                                                                      |      |  |  |  |  |
| Tidal Marsh Stream):       (more sinuous stream, flatter valley slope)       (less sinuous stream, steeper valley slope)                                                                                    |      |  |  |  |  |
| 17. Watershed size: (skip $\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5 mi <sup>2</sup> ) $\square$ Size 4 (≥ 5 mi <sup>2</sup> ) |      |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                                                                                     |      |  |  |  |  |
|                                                                                                                                                                                                             |      |  |  |  |  |
| 18. Were regulatory considerations evaluated? XYes No If Yes, check all that apply to the assessment area.                                                                                                  |      |  |  |  |  |
| Section To water □Classified Trout waters ☑ Water Supply Watersned (□I □II □II ⊠IV □V)                                                                                                                      |      |  |  |  |  |
| Deublichy owned property DNCDWR Riparian buffer rule in effect Dutrient Sensitive Waters                                                                                                                    |      |  |  |  |  |
| Anadromous fish 303(d) List CAMA Area of Environmental Concern (AEC)                                                                                                                                        |      |  |  |  |  |
| Documented presence of a federal and/or state listed protected species within the assessment area.                                                                                                          |      |  |  |  |  |
| List species:                                                                                                                                                                                               |      |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                                                  |      |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached?  Yes  No                                                                                   |      |  |  |  |  |
|                                                                                                                                                                                                             |      |  |  |  |  |
| 1. Channel water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                |      |  |  |  |  |
| $\square A$ Water infolghout assessment reach.<br>$\square B$ No flow water in pools only                                                                                                                   |      |  |  |  |  |
| $\Box C$ No water in assessment reach.                                                                                                                                                                      |      |  |  |  |  |
| 2 Evidence of Flow Postriction - approximant reach matrix                                                                                                                                                   |      |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                                                   | tha  |  |  |  |  |
| point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb with                                                                                  | thin |  |  |  |  |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris ja                                                                                | ms,  |  |  |  |  |
| beaver dams).                                                                                                                                                                                               |      |  |  |  |  |
| ⊠B Not A                                                                                                                                                                                                    |      |  |  |  |  |
| 3. Feature Pattern – assessment reach metric                                                                                                                                                                |      |  |  |  |  |
| A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                                                      |      |  |  |  |  |
| B Not A                                                                                                                                                                                                     |      |  |  |  |  |
| 4. Feature Longitudinal Profile – assessment reach metric                                                                                                                                                   |      |  |  |  |  |
| A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting. existing damming. over                                                                           |      |  |  |  |  |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of the                                                                                   | ese  |  |  |  |  |
| disturbances).                                                                                                                                                                                              |      |  |  |  |  |
| ⊠B Not A                                                                                                                                                                                                    |      |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                    |      |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability inclu                                                                             | Jde  |  |  |  |  |
| active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                                                 |      |  |  |  |  |
| □A < 10% of channel unstable                                                                                                                                                                                |      |  |  |  |  |
| IU to 25% of channel unstable                                                                                                                                                                               |      |  |  |  |  |

C > 25% of channel unstable

#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| CONSIG | ier ior |
|--------|---------|
| LB     | RB      |
| ΠA     | ΠA      |
| ⊠В     | ΜE      |

ПС

- A Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- C Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather - watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. Yes Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- □A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
   □⊠B Multiple sticks and/or leaf packs and/or emergent vegetation
   □⊠C Multiple snags and logs (including lap trees)
   □∑0 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | ]F<br>]G<br>]H<br>]J<br>]J<br>]K |
|------------------------------------------|----------------------------------|
|------------------------------------------|----------------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

|           |           |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-----------|-----------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square$ | $\square$ |  | Detritus<br>Artificial (rip-rap, concrete, etc.)                                                                                                       |

11d. Tyes XNo Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1

| ☐Adult frogs         |
|----------------------|
| Aquatic reptiles     |
| Aquatic macrophy     |
| Beetles              |
| ⊠Caddisfly larvae (1 |
| Asian clam (Corbi    |
| Crustacean (isopo    |
| Damselfly and dra    |
| Dipterans            |
| Mayfly larvae (E)    |
| Megaloptera (alde    |
| Midges/mosquito I    |

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Damselfly and dragonfly larvae
- Dipterans
- Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish Salamanders/tadpoles
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. LB RB

| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| □в | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| В  | RB |
|----|----|
| A  | ΠA |
| ∃В | □в |
|    |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- В Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- □C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

## Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- Assessment reach relocated to valley edge ΠE
- ⊠F None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- □в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWooLBRBLB $\boxtimes A$ $\boxtimes A$ $\boxtimes A$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square E$ $\square E$ $\square E$                                                                                                                                                                                 | bded<br>RB<br>$\boxtimes A \ge 100$ feet wide <u>or</u> extends to the edge of the watershed<br>$\square B$ From 50 to < 100 feet wide<br>$\square C$ From 30 to < 50 feet wide<br>$\square D$ From 10 to < 30 feet wide<br>$\square E < 10$ feet wide <u>or</u> no trees                                                                                                                                              |  |  |  |  |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| 20. | <ul> <li>Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> <li>LB RB</li> <li>□A □A Mature forest</li> <li>□B □B Non-mature woody vegetation or modified vegetation structure</li> <li>□C □C Herbaceous vegetation with or without a strip of trees &lt; 10 feet wide</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 21. | E E<br>Buffer Stressors<br>Check all approp<br>within 30 feet of st                                                                                                                                                                                                                                                                                                                                             | Little or no vegetation - streamside area metric (skip for Tidal Marsh Streams) riate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is ream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet). oving stressors occurs on oither bank, check here and skip to Matric 22:                                                              |  |  |  |  |
|     | Abuts< 30                                                                                                                                                                                                                                                                                                                                                                                                       | $O feet$ 30-50 feet         RB       LB       RB $\Box A$ $\Box A$ Row crops $\Box B$ $\Box B$ $\Box B$ $\Box C$ $\Box C$ Pasture (no livestock)/commercial horticulture $\Box D$ $\Box D$ $\Box D$ $\Box D$ $\Box D$ Pasture (active livestock use)                                                                                                                                                                   |  |  |  |  |
| 22. | Stem Density – s<br>Consider for left                                                                                                                                                                                                                                                                                                                                                                           | treamside area metric (skip for Tidal Marsh Streams)<br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).                                                                                                                                                                                                                                                                                           |  |  |  |  |
|     | LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                                                                                                                                                                                                                                                                                                                | Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                          |  |  |  |  |
| 23. | Continuity of Veg<br>Consider whether<br>LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                                                                                                                                                                                                                                                                       | etated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                    |  |  |  |  |
| 24. | 4. Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)<br>Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>assessment reach habitat.                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                 | Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.                                                                                                                                                                                                                                               |  |  |  |  |
|     | ⊠B ⊠B                                                                                                                                                                                                                                                                                                                                                                                                           | Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees. |  |  |  |  |
|     | □c □c                                                                                                                                                                                                                                                                                                                                                                                                           | Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                              |  |  |  |  |
| 25. | Conductivity – as<br>25a.<br>If No, select                                                                                                                                                                                                                                                                                                                                                                      | sessment reach metric (skip for all Coastal Plain streams) No Was conductivity measurement recorded? one of the following reasons. □No Water □Other:                                                                                                                                                                                                                                                                   |  |  |  |  |
|     | 25b. Check the b<br>□A < 46                                                                                                                                                                                                                                                                                                                                                                                     | ox corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>☐B 46 to < 67                                                                                                                                                                                                                                                                                                              |  |  |  |  |
|     |                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                  | Honey Mill                                      | Date of Assessment                     | t 09/04/2019 | 9              |
|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------|--------------|----------------|
| Stream Category                                                   | Pb1                                             | Assessor Name/Organization             | H. Reed/ V   | Vildlands Eng. |
|                                                                   |                                                 |                                        |              |                |
| Notes of Field Asses                                              | ssment Form (Y/N)                               |                                        | NO           |                |
| Presence of regulate                                              | ory considerations (Y/N)                        |                                        | YES          |                |
| Additional stream in                                              | formation/supplementary measure                 | rements included (Y/N)                 | NO           |                |
| NC SAM feature type (perennial, intermittent, Tidal Marsh Stream) |                                                 |                                        | Perennial    |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | Function Class Rating Summ                      | harv A                                 | USACE/       | Intermittent   |
|                                                                   | (1) Hydrology                                   | iuiy r                                 | HIGH         | Internittent   |
|                                                                   | (2) Baseflow                                    | —                                      | HIGH         |                |
|                                                                   | (2) Flood Flow                                  | —                                      | HIGH         |                |
|                                                                   | (3) Streamside Are                              | ea Attenuation                         | MEDIUM       |                |
|                                                                   | (d) Floodpla                                    | in Access                              | MEDIUM       |                |
|                                                                   | (1) Nooded                                      | Riparian Buffer                        | HIGH         |                |
|                                                                   | (4) Microton                                    | ography                                | NA           |                |
|                                                                   | (3) Stream Stabilit                             | v                                      | HIGH         |                |
|                                                                   | (4) Channel                                     | ,<br>Stability                         | MEDIUM       |                |
|                                                                   | (4) Sedimer                                     | ot Transport                           | HIGH         |                |
|                                                                   | (4) Stream (                                    |                                        | HIGH         |                |
|                                                                   | (2) Stream/Intertid                             | al Zone Interaction                    | NA           |                |
|                                                                   | (2) Longitudinal Tid                            |                                        | NA           |                |
|                                                                   | (2) Tidal Marsh Str                             | aam Stability                          | NA           |                |
|                                                                   | (2) Tidai Marsh Site                            | sh Channel Stability                   | NA           |                |
|                                                                   | (3) Tidal Mar                                   | sh Stream Geomorphology                |              |                |
|                                                                   | (3) Tidai Mai                                   | Sil Silean Geomorphology               |              |                |
|                                                                   | (1) Water Quality<br>(2) Baseflow               | —                                      | HIGH         |                |
|                                                                   | (2) Streamside Area Vec                         |                                        |              |                |
|                                                                   | (2) Streamside Area Veg                         | nt Filtration                          |              |                |
|                                                                   | (3) Thermoregulat                               | ion                                    | HIGH         |                |
|                                                                   | (2) Indicators of Stressor                      |                                        | VES          |                |
|                                                                   | (2) Aquatic Life Tolerano                       | ······································ |              |                |
|                                                                   | (2) Intertidal Zone Filtratio                   | n                                      | NA           |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | (1) Habitat                                     |                                        |              |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | (3) Substrate                                   |                                        | нісн         |                |
|                                                                   | (3) Stroom Stabilit                             |                                        |              |                |
|                                                                   | (3) In stroom Lobi                              | y                                      |              |                |
|                                                                   | (3) III-Suediii Habi<br>(2) Streem_side Usbitet |                                        | нісч         |                |
|                                                                   | (2) Stream side L                               | ahitat                                 | нісн         |                |
|                                                                   | (3) Thermoregulat                               | ion                                    | нісн         |                |
|                                                                   | (2) Tidal Marsh In stream                       | Habitat                                |              |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | (3) Iidal Marsh Stre                            | eam Stability                          |              |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | (4) I idal Mar                                  | sn Stream Geomorphology                |              |                |
|                                                                   | (3) Indai Marsh In-S                            |                                        | INA<br>NA    |                |
|                                                                   |                                                 |                                        |              |                |
|                                                                   | Overall                                         |                                        | HIGH         |                |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                                                                                              | USACE AID #: NCDWR #:                                                                                                                                                                                                                            |                                                              |                                            |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle, |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| and circle the location of the s                                                                                                          | tream reach under evaluation. If mult                                                                                                                                                                                                            | ple stream reaches will be evaluated                         | on the same property, identify and         |  |  |
| number all reaches on the atta                                                                                                            | tched map, and include a separate form                                                                                                                                                                                                           | n for each reach. See the NC SAM U                           | Iser Manual for detailed descriptions      |  |  |
| NC SAM User Manual for exa                                                                                                                | a information. Record in the Notes/Sk                                                                                                                                                                                                            | etch section if supplementary meas                           | urements were performed. See the           |  |  |
| NOTE EVIDENCE OF STRES                                                                                                                    | SORS AFFECTING THE ASSESSME                                                                                                                                                                                                                      | INT AREA (do not need to be withi                            | n the assessment area).                    |  |  |
| PROJECT/SITE INFORMATI                                                                                                                    | ON:                                                                                                                                                                                                                                              |                                                              |                                            |  |  |
| 1. Project name (if any):                                                                                                                 | Honey Mill                                                                                                                                                                                                                                       | 2. Date of evaluation:09/04/2                                | 2019                                       |  |  |
| 3. Applicant/owner name:                                                                                                                  | NCDMS                                                                                                                                                                                                                                            | 4. Assessor name/organization:                               | H. Reed/ Wildlands Eng.                    |  |  |
| 5. County:                                                                                                                                | Suffy                                                                                                                                                                                                                                            | 6. Nearest named water body                                  | Arorat Pivor                               |  |  |
| 8 Site coordinates (decimal d                                                                                                             |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| STREAM INFORMATION: (d                                                                                                                    | epth and width can be approximatio                                                                                                                                                                                                               | ns)                                                          |                                            |  |  |
| 9. Site number (show on attac                                                                                                             | hed map): <u>UT2 R2</u> 1                                                                                                                                                                                                                        | 0. Length of assessment reach evalu                          | lated (feet): 150                          |  |  |
| 11. Channel depth from bed (i                                                                                                             | n riffle, if present) to top of bank (feet):                                                                                                                                                                                                     |                                                              | Jnable to assess channel depth.            |  |  |
| 12. Channel width at top of ba                                                                                                            | nk (feet): <u>5 - 8'</u> 13.                                                                                                                                                                                                                     | Is assessment reach a swamp stean                            | n? ∐Yes ∐No                                |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                  | sh Stream                                                    |                                            |  |  |
| 15 NC SAM Zone                                                                                                                            | Mountains (M) Piedmon                                                                                                                                                                                                                            | t (P) 🛛 Inner Coastal Plain (I)                              | Outer Coastal Plain (O)                    |  |  |
| 13. NO OAM Zone.                                                                                                                          |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| 16 Estimated geomorphic                                                                                                                   | _ \                                                                                                                                                                                                                                              |                                                              | /                                          |  |  |
| valley shape ( <b>skip for</b>                                                                                                            |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| Tidal Marsh Stream):                                                                                                                      | (more sinuous stream, flatter valley                                                                                                                                                                                                             | v slope) (less sinuous st                                    | ream, steeper valley slope)                |  |  |
| 17. Watershed size: (skip                                                                                                                 | ⊠Size 1 (< 0.1 mi²) □Size 2 (0                                                                                                                                                                                                                   | .1 to < 0.5 mi <sup>2</sup> ) Size 3 (0.5 to <               | ≤ 5 mi²) □Size 4 (≥ 5 mi²)                 |  |  |
| for Tidal Marsh Stream)                                                                                                                   |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
|                                                                                                                                           | l:<br>Niana avaluatad? MVaa MNa IfVaa                                                                                                                                                                                                            | check all that apply to the access                           |                                            |  |  |
| 18. Were regulatory considera                                                                                                             |                                                                                                                                                                                                                                                  | , check all that apply to the assessme<br>Water Supply Water | rshed (DI DII DIII MIV DV)                 |  |  |
| Essential Fish Habitat                                                                                                                    | Primary Nursery Area                                                                                                                                                                                                                             | High Quality Water                                           | s/Outstanding Resource Waters              |  |  |
| Publicly owned property                                                                                                                   | / INCDWR Riparian buffer ru                                                                                                                                                                                                                      | Ile in effect INutrient Sensitive W                          | Vaters                                     |  |  |
| Anadromous fish                                                                                                                           | 303(d) List                                                                                                                                                                                                                                      | CAMA Area of Envi                                            | ronmental Concern (AEC)                    |  |  |
| Documented presence                                                                                                                       | of a federal and/or state listed protecte                                                                                                                                                                                                        | d species within the assessment area                         | a.                                         |  |  |
|                                                                                                                                           | vitet (liet anagies)                                                                                                                                                                                                                             |                                                              |                                            |  |  |
| 19. Are additional stream info                                                                                                            | mation/supplementary measurements                                                                                                                                                                                                                | included in "Notes/Sketch" section or                        | r attached? □Yes ⊠No                       |  |  |
|                                                                                                                                           | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, _, |                                                              |                                            |  |  |
| 1. Channel Water – assessi                                                                                                                | ment reach metric (skip for Size 1 st                                                                                                                                                                                                            | reams and Tidal Marsh Streams)                               |                                            |  |  |
| A Water throughou                                                                                                                         | t assessment reach.                                                                                                                                                                                                                              |                                                              |                                            |  |  |
| $\square C$ No water in asse                                                                                                              | ssment reach.                                                                                                                                                                                                                                    |                                                              |                                            |  |  |
| 2 Evidence of Flow Restric                                                                                                                | tion — assessment reach metric                                                                                                                                                                                                                   |                                                              |                                            |  |  |
| $\square A$ At least 10% of a                                                                                                             | assessment reach in-stream habitat or                                                                                                                                                                                                            | riffle-pool sequence is severely affe                        | ected by a flow restriction or fill to the |  |  |
| point of obstructi                                                                                                                        | ng flow <u>or</u> a channel choked with aqua                                                                                                                                                                                                     | atic macrophytes <u>or</u> ponded water <u>or</u>            | impoundment on flood or ebb within         |  |  |
| the assessment                                                                                                                            | reach (examples: undersized or perche                                                                                                                                                                                                            | ed culverts, causeways that constrict                        | the channel, tidal gates, debris jams,     |  |  |
| beaver dams).<br>⊠B Not A                                                                                                                 |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| 3. Feature Pattern – assess $\Box A$ majority of the                                                                                      | ment reach metric                                                                                                                                                                                                                                | (examples: straightening, modificatio                        | n above or below culvert)                  |  |  |
| $\square A$ A majority of the $\square B$ Not A                                                                                           | assessment react has altered pattern                                                                                                                                                                                                             | (examples: straightening, mounicatio                         | Tabove of below curverty.                  |  |  |
| 4 Feature Longitudinal Pro                                                                                                                | file - assessment reach motric                                                                                                                                                                                                                   |                                                              |                                            |  |  |
| A Majority of asses                                                                                                                       | sment reach has a substantially altered                                                                                                                                                                                                          | d stream profile (examples: channel                          | down-cutting existing damming over         |  |  |
| widening, active                                                                                                                          | aggradation, dredging, and excavatio                                                                                                                                                                                                             | n where appropriate channel profile                          | has not reformed from any of these         |  |  |
| disturbances).                                                                                                                            |                                                                                                                                                                                                                                                  | · · · ·                                                      |                                            |  |  |
| ⊠B Not A                                                                                                                                  |                                                                                                                                                                                                                                                  |                                                              |                                            |  |  |
| 5. Signs of Active Instabilit                                                                                                             | y – assessment reach metric                                                                                                                                                                                                                      |                                                              |                                            |  |  |
| Consider only current in                                                                                                                  | stability, not past events from which                                                                                                                                                                                                            | h the stream has currently recover                           | ered. Examples of instability include      |  |  |
| active bank failure, active $\Box \Delta = - \frac{10\%}{2}$ of chapped                                                                   | channel down-cutting (head-cut), active                                                                                                                                                                                                          | e widening, and artificial hardening (s                      | uch as concrete, gabion, rip-rap).         |  |  |
| $\square R > 10\%$ of channel $\square B = 10$ to 25% of cha                                                                              | innel unstable                                                                                                                                                                                                                                   |                                                              |                                            |  |  |
| $\boxtimes$ C > 25% of channel                                                                                                            | l unstable                                                                                                                                                                                                                                       |                                                              |                                            |  |  |

#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| Consid | Jer for th |
|--------|------------|
| LB     | RB         |
| ⊠Α     | ΠA         |
| ПВ     | ØВ         |

ПС

- A Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather – watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. Yes Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- □A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
   □B Multiple sticks and/or leaf packs and/or emergent vegetation
   □C Multiple snags and logs (including lap trees)
   □5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only<br>Mary<br>A C H D |  |
|-------------------------------------------------------------|--|
|-------------------------------------------------------------|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  R
  C
  A
  P

|           |  |  | Bedrock/saprolite<br>Boulder ( $256 - 4096 \text{ mm}$ )<br>Cobble ( $64 - 256 \text{ mm}$ )<br>Gravel ( $2 - 64 \text{ mm}$ )<br>Sand ( $.062 - 2 \text{ mm}$ )<br>Silt/clay (< $0.062 \text{ mm}$ )<br>Detritus |
|-----------|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\square$ |  |  | Artificial (rip-rap, concrete, etc.)                                                                                                                                                                              |

11d. Tyes XNo Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/cravfish/shrimp)
- Damselfly and dragonfly larvae
  - Dipterans
  - Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
  - Midges/mosquito larvae
  - Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Salamanders/tadpoles Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

- Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. LB RB
  - ΠA ΠA Little or no alteration to water storage capacity over a majority of the streamside area ⊠в ⊠в Moderate alteration to water storage capacity over a majority of the streamside area ПС ПС Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)

#### 14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA □В ⊡в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

## Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΞE Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

#### 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- Assessment reach relocated to valley edge ΠE
- ΠF None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- □в Degraded (example: scattered trees)
- ⊠C Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLB $\square A$ $\square A$ $\square A$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square E$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square D$ $\square E$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | edge of the watershed                                                                                                                                                                                                                                                                                                                                      |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | 20. Buffer Structure – streamside area metric (skip for Tidal N<br>Consider for left bank (LB) and right bank (RB) for Metric<br>LB RB<br>A A Mature forest<br>B B Non-mature woody vegetation or modified<br>C MC Herbaceous vegetation with or without a st                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | larsh Streams)<br>19 ("Vegetated" Buffer Width).<br>vegetation structure<br>rip of trees < 10 feet wide                                                                                                                                                                                                                                                    |
|     | D D Maintained shrubs<br>E E Little or no vegetation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                            |
| 21. | 21. Buffer Stressors – streamside area metric (skip for Tidal M<br>Check all appropriate boxes for left bank (LB) and right ba<br>within 30 feet of stream (< 30 feet), or is between 30 to 50 feet<br>If none of the following stressors occurs on either bank, of<br>Abuts < 30 feet 30-50 feet<br>LB RB LB RB LB RB<br>A A A A A A A A Row crops<br>B B B B B B B B B Maintained turf<br>C C C C C C C C C Pasture (no lives<br>XD XD XD XD XD XD A Pasture (active I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Iarsh Streams)<br>nk (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is<br>of stream (30-50 feet).<br>heck here and skip to Metric 22: □<br>tock)/commercial horticulture<br>vestock use)                                                                                                                                        |
| 22. | 22. Stem Density – streamside area metric (skip for Tidal Mars<br>Consider for left bank (LB) and right bank (RB) for Metric<br>LB RB<br>□A □A Medium to high stem density<br>⊠B ⊠B Low stem density<br>□C □C No wooded riparian buffer or predominantly                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | s <b>h Streams)</b><br>I9 ("Wooded" Buffer Width).<br>/ herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                           |
| 23. | 23. Continuity of Vegetated Buffer – streamside area metric (s<br>Consider whether vegetated buffer is continuous along stream<br>LB RB<br>⊠A ⊠A The total length of buffer breaks is < 25 per<br>B B The total length of buffer breaks is betweer<br>□C □C The total length of buffer breaks is > 50 per                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | kip for Tidal Marsh Streams)<br>(parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>ccent.<br>25 and 50 percent.<br>cent.                                                                                                                                                                                                                   |
| 24. | <ul> <li>Vegetative Composition – streamside area metric (skip for Evaluate the dominant vegetation within 100 feet of each ban assessment reach habitat.</li> <li>LB RB</li> <li>A A Vegetation is close to undisturbed in special with non patient invariant ended and assess to undisturbed in special with non patient invariant ended and assess to undisturbed in special with non patient invariant ended and assess to undisturbed in special with non patient invariant ended and assess to undisturbed in special with non patient invariant ended and assess to undisturbed in special with non-patient invariant ended and assess to undisturbed in special with non-patient invariant ended and assess to undisturbed in the special ended and assess to undisturbed and assessess to undisturbed and assess to undisturbed and assess to un</li></ul> | • Tidal Marsh Streams)<br>< or to the edge of the watershed (whichever comes first) as it contributes to<br>es present and their proportions. Lower strata composed of native species,                                                                                                                                                                     |
|     | ⊠B       □B       Vegetation indicates disturbance in terms species. This may include communities communities with non-native invasive spec communities missing understory but retaining C         □C       ⊠C       Vegetation is severely disturbed in terms of the terms of terms of the terms of ter                                                                                             | of species diversity or proportions, but is still largely composed of native<br>of weedy native species that develop after clear-cutting or clearing <u>or</u><br>ies present, but not dominant, over a large portion of the expected strata <u>or</u><br>ng canopy trees.<br>if species diversity or proportions. Mature canopy is absent or communities. |
|     | with non-native invasive species dominant<br>stands of non-characteristic species <u>or</u> con                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | over a large portion of expected strata <u>or</u> communities composed of planted imunities inappropriately composed of a single species <u>or</u> no vegetation.                                                                                                                                                                                          |
| 25. | 25. Conductivity – assessment reach metric (skip for all Coas<br>25a. ☐Yes ⊠No Was conductivity measurement record<br>If No, select one of the following reasons. ☐No Water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | tal Plain streams)<br>ed?<br>Other:                                                                                                                                                                                                                                                                                                                        |
|     | 25b. Check the box corresponding to the conductivity measur<br>$\Box A < 46 \Box B 46$ to $< 67 \Box C 67$ to $< 75$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ement (units of microsiemens per centimeter).<br>D                                                                                                                                                                                                                                                                                                         |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name      | Honey Mill                        | Date of Assessmen          | t 09/04/2019          | 9              |
|-----------------------|-----------------------------------|----------------------------|-----------------------|----------------|
| Stream Category       | Pa1                               | Assessor Name/Organizatior | H. Reed/ V            | Vildlands Eng. |
|                       |                                   |                            |                       |                |
| Notes of Field Asses  | ssment Form (Y/N)                 |                            | NO                    |                |
| Presence of regulato  | ory considerations (Y/N)          |                            | YES                   |                |
| Additional stream inf | formation/supplementary measu     | irements included (Y/N)    | NO                    |                |
| NC SAM feature type   | e (perennial, intermittent, Tidal | Marsh Stream)              | Perennial             |                |
|                       |                                   |                            |                       |                |
|                       | Function Class Rating Sum         | mary                       | USACE/<br>All Streams | Intermittent   |
|                       | (1) Hydrology                     |                            | MEDIUM                |                |
|                       | (2) Baseflow                      |                            | MEDIUM                |                |
|                       | (2) Flood Flow                    |                            | MEDIUM                |                |
|                       | (3) Streamside A                  | rea Attenuation            | MEDIUM                |                |
|                       | (4) Floodpl                       | ain Access                 | HIGH                  |                |
|                       | (4) Woode                         | d Riparian Buffer          | LOW                   |                |
|                       | (4) Microto                       | pography                   | MEDIUM                |                |
|                       | (3) Stream Stabili                | itv                        | MEDIUM                |                |
|                       | (4) Channe                        | el Stability               | LOW                   |                |
|                       | (4) Sedime                        | nt Transport               | HIGH                  |                |
|                       | (4) Stream                        | Geomorphology              | HIGH                  |                |
|                       | (2) Stream/Interti                | dal Zone Interaction       | NA                    |                |
|                       | (2) Longitudinal Ti               | dal Flow                   | NA                    |                |
|                       | (2) Tidal Marsh St                | ream Stability             | NA                    |                |
|                       | (2) Tidal Maron Ca                | arsh Channel Stability     | NA                    |                |
|                       | (3) Tidal Ma                      | arsh Stream Geomorphology  | NA                    |                |
|                       | (1) Water Quality                 |                            | LOW                   |                |
|                       | (2) Baseflow                      |                            | MEDIUM                |                |
|                       | (2) Streamside Area Ve            | aetation                   | LOW                   |                |
|                       | (3) Upland Polluta                | ant Filtration             | LOW                   |                |
|                       | (3) Thermoregula                  | tion                       | LOW                   |                |
|                       | (2) Indicators of Stresso         | ors                        | YES                   |                |
|                       | (2) Aquatic Life Toleran          |                            | HIGH                  |                |
|                       | (2) Intertidal Zone Filtration    | on                         | NA                    |                |
|                       | (1) Habitat                       |                            | MEDIUM                |                |
|                       | (2) In-stream Habitat             |                            | HIGH                  |                |
|                       | (3) Baseflow                      |                            | MEDIUM                |                |
|                       | (3) Substrate                     |                            | HIGH                  |                |
|                       | (3) Stream Stabil                 | ity                        | LOW                   |                |
|                       | (3) In-stream Hab                 |                            | HIGH                  |                |
|                       | (2) Stream-side Habitat           |                            | LOW                   |                |
|                       | (3) Stream-side H                 | labitat                    | MEDIUM                |                |
|                       | (3) Thermoregula                  | tion                       | LOW                   |                |
|                       | (2) Tidal Marsh In-stream         | n Habitat                  | NA                    |                |
|                       | (3) Flow Restrictio               | n                          | NA                    |                |
|                       | (3) Tidal Marsh St                | ream Stability             | NA                    |                |
|                       | (4) Tidal Ma                      | arsh Channel Stability     | NA                    |                |
|                       | (4) Tidal Ma                      | arsh Stream Geomorphology  | NA                    |                |
|                       | (3) Tidal Marsh In-               | stream Habitat             | NA                    |                |
|                       | (2) Intertidal Zone               | _                          | NA                    |                |
|                       | Overall                           |                            | MEDIUM                |                |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                                                       |                                                                                        | NCDWR #:                                 |                                                            |  |  |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------|--|--|
| INSTRUCTIONS: Attach a sl                                                                          | ketch of the assessment area and photogra                                              | aphs. Attach a copy of the USGS          | 7.5-minute topographic quadrangle,                         |  |  |
| and circle the location of the                                                                     | stream reach under evaluation. If multiple                                             | stream reaches will be evaluated         | on the same property, identify and                         |  |  |
| number all reaches on the atta                                                                     | ached map, and include a separate form to<br>d information. Record in the "Notes/Sketc | br each reach. See the NC SAM Us         | ser Manual for detailed descriptions                       |  |  |
| NC SAM User Manual for exa                                                                         | amples of additional measurements that ma                                              | av be relevant.                          | arements were performed. See the                           |  |  |
| NOTE EVIDENCE OF STRES                                                                             | SSORS AFFECTING THE ASSESSMENT                                                         | AREA (do not need to be within           | n the assessment area).                                    |  |  |
| PROJECT/SITE INFORMATI                                                                             | ION:                                                                                   |                                          |                                                            |  |  |
| 1. Project name (if any):                                                                          | Honey Mill                                                                             | 2. Date of evaluation: 09/05/2           | 019                                                        |  |  |
| 3. Applicant/owner name:                                                                           | NCDMS                                                                                  | 4. Assessor name/organization:           | H. Reed/ Wildlands Eng.                                    |  |  |
| 5. County:                                                                                         | Surry                                                                                  | 6. Nearest named water body              | Areret Diver                                               |  |  |
| 8 Site coordinates (decimal c                                                                      | degrees at lower end of assessment reach                                               | ) 36 429054 -80 612263                   |                                                            |  |  |
| STREAM INFORMATION: (d                                                                             | lepth and width can be approximations)                                                 |                                          |                                                            |  |  |
| 9. Site number (show on attac                                                                      | ched map): <u>UT3 R1</u> 10. Í                                                         | _ength of assessment reach evalu         | ated (feet): 200                                           |  |  |
| 11. Channel depth from bed (                                                                       | in riffle, if present) to top of bank (feet):                                          | <u>1 - 2'</u>                            | nable to assess channel depth.                             |  |  |
| 12. Channel width at top of ba                                                                     | ank (feet): <u>5 - 8'</u> 13. Is a                                                     | assessment reach a swamp steam           | ? ∐Yes ∐No                                                 |  |  |
|                                                                                                    |                                                                                        | Stream                                   |                                                            |  |  |
| 15. NC SAM Zone:                                                                                   | Mountains (M) Piedmont (F                                                              | P) □ Inner Coastal Plain (I)             | Outer Coastal Plain (O)                                    |  |  |
|                                                                                                    |                                                                                        | ,                                        |                                                            |  |  |
|                                                                                                    |                                                                                        |                                          |                                                            |  |  |
| 16. Estimated geomorphic                                                                           |                                                                                        |                                          | -                                                          |  |  |
| valley shape ( <b>skip for</b>                                                                     |                                                                                        |                                          |                                                            |  |  |
|                                                                                                    |                                                                                        | ope) (less sinuous str                   |                                                            |  |  |
| 17. Watershed size: (Skip<br>for Tidal Marsh Stream)                                               | $\boxtimes$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 f                    | $co < 0.5 \text{ m}^2$ [Size 3 (0.5 to < | $5 \text{ m}^2$ ) $\square$ Size 4 ( $\ge 5 \text{ m}^2$ ) |  |  |
| ADDITIONAL INFORMATIO                                                                              | N:                                                                                     |                                          |                                                            |  |  |
| 18. Were regulatory consideration                                                                  | ations evaluated? ⊠Yes ⊟No If Yes, ch                                                  | eck all that apply to the assessme       | ent area.                                                  |  |  |
| Section 10 water                                                                                   | Classified Trout Waters                                                                | Water Supply Water                       | shed (□I □II □III ⊠IV □V)                                  |  |  |
| Essential Fish Habitat                                                                             | Primary Nursery Area     INCDW/P Piperion buffer rule                                  | In effect INutrient Sensitive W          | 6/Outstanding Resource Waters                              |  |  |
|                                                                                                    |                                                                                        |                                          | onmental Concern (AEC)                                     |  |  |
| Documented presence of a federal and/or state listed protected species within the assessment area. |                                                                                        |                                          |                                                            |  |  |
| List species:                                                                                      | List species:                                                                          |                                          |                                                            |  |  |
| Designated Critical Hal                                                                            | Ditat (list species)                                                                   | luded in "Notes/Skatch" section or       | attached? 🗆 Ves 🕅 No                                       |  |  |
| 19. Are additional stream into                                                                     |                                                                                        | idded in Notes/Oketen Section of         |                                                            |  |  |
| 1. Channel Water – assess                                                                          | ment reach metric (skip for Size 1 strea                                               | ms and Tidal Marsh Streams)              |                                                            |  |  |
| A Water throughou                                                                                  | ut assessment reach.                                                                   |                                          |                                                            |  |  |
| $\square B$ No now, water in asse                                                                  | essment reach.                                                                         |                                          |                                                            |  |  |
| 2 Evidence of Flow Postri                                                                          | ation accomment reach matric                                                           |                                          |                                                            |  |  |
| $\Box A$ At least 10% of                                                                           | assessment reach in-stream habitat or riff                                             | le-pool sequence is severely affe        | cted by a flow restriction or fill to the                  |  |  |
| point of obstruct                                                                                  | ing flow <u>or</u> a channel choked with aquatic                                       | macrophytes or ponded water or           | impoundment on flood or ebb within                         |  |  |
| the assessment                                                                                     | reach (examples: undersized or perched of                                              | culverts, causeways that constrict       | the channel, tidal gates, debris jams,                     |  |  |
| $\square$ B Not A                                                                                  |                                                                                        |                                          |                                                            |  |  |
| 3 Eastura Pattorn - assos                                                                          | smont roach motric                                                                     |                                          |                                                            |  |  |
| $\Box A$ A majority of the                                                                         | assessment reach has altered pattern (ex                                               | amples: straightening, modification      | above or below culvert).                                   |  |  |
| B Not A                                                                                            | F (                                                                                    |                                          |                                                            |  |  |
| 4. Feature Longitudinal Pro                                                                        | ofile – assessment reach metric                                                        |                                          |                                                            |  |  |
| A Majority of asses                                                                                | ssment reach has a substantially altered st                                            | ream profile (examples: channel o        | lown-cutting, existing damming, over                       |  |  |
| widening, active                                                                                   | aggradation, dredging, and excavation w                                                | here appropriate channel profile         | has not reformed from any of these                         |  |  |
| $\square$ B Not A                                                                                  |                                                                                        |                                          |                                                            |  |  |
| 5 Signe of Active Instabilit                                                                       | ty _ accordment reach matric                                                           |                                          |                                                            |  |  |
| Consider only current in                                                                           | nstability, not past events from which t                                               | he stream has currently recover          | red. Examples of instability include                       |  |  |
| active bank failure, active                                                                        | channel down-cutting (head-cut), active wi                                             | dening, and artificial hardening (su     | uch as concrete, gabion, rip-rap).                         |  |  |
| $\square A$ < 10% of channel $\square B$ = 10 to 25% of channel                                    |                                                                                        |                                          |                                                            |  |  |
| $\square \square$ 10 to 25% of channel $\square \square$ > 25% of channel                          | anner unstable<br>el unstable                                                          |                                          |                                                            |  |  |

#### Streamside Area Interaction - streamside area metric 6. Consider for the Left Bank (LB) and the Right Bank (RB).

| CONSIC |    |
|--------|----|
| LB     | RB |
| ΠA     | ΠA |
| ⊠в     | ØВ |

ПС

- Little or no evidence of conditions that adversely affect reference interaction ΠA
- ⊠в Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- ΠJ Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes ⊠No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses ΠA (include liverworts, lichens, and algal mats) ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ПС Multiple snags and logs (including lap trees) ĪΩD 5% undercut banks and/or root mats and/or roots in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | =<br>G<br>H<br>J<br>K |  |
|------------------------------------------|-----------------------|--|
|------------------------------------------|-----------------------|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - ⊠В Pool-glide section (evaluate 11d)
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. NP P C ۸ D

|  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.)                                                                             |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1

|             | Adult frogs        |
|-------------|--------------------|
|             | Aquatic reptiles   |
|             | Aquatic macrophy   |
|             | Beetles            |
| $\boxtimes$ | Caddisfly larvae ( |
|             | Asian clam (Corb   |
|             | Crustacean (isopo  |
|             | Damselfly and dra  |
|             | Dipterans          |
|             | Mayfly larvae (E)  |

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
- Dipterans
- Mayfly larvae (E)
- Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea*)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. LB RB

| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| □в | □в | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| В | RB |
|---|----|
| A | ΠA |
| В | □В |
|   |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- В Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- □C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
- ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ΠA Streams and/or springs (jurisdictional discharges)
- □в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- Assessment reach relocated to valley edge ΠE
- ΠF None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

| 19. | Buffer Width – streamside area metric | (ski | p for | Tidal | Marsh | Streams) |
|-----|---------------------------------------|------|-------|-------|-------|----------|
|     |                                       | ·    |       |       |       |          |

Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.

|     | to the first break           Vegetated         Wo           LB         RB         LB           A         A         A           B         B         B         B           C         C         C         C           D         D         D         C           E         E         E         E | oded<br>RB<br>A □A ≥ 100 feet wide <u>or</u> extends to the edge of the watershed<br>B □B From 50 to < 100 feet wide<br>C ⊠C From 30 to < 50 feet wide<br>D □D From 10 to < 30 feet wide<br>E □E < 10 feet wide <u>or</u> no trees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure           Consider for left           LB         RB           □A         □A           □B         □B           □C         □C           □D         □D           □E         □E                                                                                                 | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)<br/>bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> <li>Mature forest<br/>Non-mature woody vegetation <u>or</u> modified vegetation structure<br/>Herbaceous vegetation with or without a strip of trees &lt; 10 feet wide<br/>Maintained shrubs<br/>Little or no vegetation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 21. | Buffer Stressors         Check all approp         within 30 feet of s         If none of the fol         Abuts       < 3         LB       RB       LB         A       A       A         B       B       B       B         C       C       C       C         MD       MD       MD       M     | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)</li> <li>priate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is tream (&lt; 30 feet), or is between 30 to 50 feet of stream (30-50 feet).</li> <li>lowing stressors occurs on either bank, check here and skip to Metric 22:</li> <li>0 feet 30-50 feet</li> <li>RB LB RB</li> <li>A A A A Row crops</li> <li>B B B Maintained turf</li> <li>C C C C C Pasture (no livestock)/commercial horticulture</li> <li>D ØD ØD ØD Pasture (active livestock use)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 22. | Stem Density – s         Consider for left         LB       RB         □A       △A         △B       □B         □C       □C                                                                                                                                                                   | s <b>treamside area metric (skip for Tidal Marsh Streams)</b><br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 23. | Continuity of Ver<br>Consider whether<br>LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                                                                                                                                                    | getated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 24. | Vegetative Comp         Evaluate the dom         assessment reach         LB       RB         □A       □A         □B       ⊠B         ⊠C       □C                                                                                                                                            | <ul> <li>bosition – streamside area metric (skip for Tidal Marsh Streams)</li> <li>inant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to a habitat.</li> <li>Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.</li> <li>Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities missing understory but retaining canopy trees.</li> <li>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.</li> </ul> |
| 25. | Conductivity – a<br>25a. ∐Yes ⊠<br>If No, select                                                                                                                                                                                                                                             | ssessment reach metric (skip for all Coastal Plain streams)<br>No Was conductivity measurement recorded?<br>one of the following reasons. No Water Other:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|     | 25b. Check the b<br>□A < 46                                                                                                                                                                                                                                                                  | to corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square B$ 46 to < 67 $\square C$ 67 to < 79 $\square D$ 79 to < 230 $\square E \ge 230$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name      | am Site Name Honey Mill Date of Assess      |                           |           | ient 09/05/2019         |  |  |
|-----------------------|---------------------------------------------|---------------------------|-----------|-------------------------|--|--|
| Stream Category       | eam Category Pb1 Assessor Name/Organization |                           |           | H. Reed/ Wildlands Eng. |  |  |
|                       |                                             |                           |           |                         |  |  |
| Notes of Field Asses  | ssment Form (Y/N)                           |                           | NO        |                         |  |  |
| Presence of regulate  | ory considerations (Y/N)                    |                           | YES       |                         |  |  |
| Additional stream inf | formation/supplementary measu               | irements included (Y/N)   | NO        |                         |  |  |
| NC SAM feature typ    | e (perennial, intermittent, Tidal I         | Marsh Stream)             | Perennial |                         |  |  |
|                       |                                             |                           |           |                         |  |  |
|                       | Eurotion Class Pating Sum                   | 201                       | USACE/    | NCDWR                   |  |  |
|                       | (1) Hydrology                               | lialy                     | MEDILIM   | Internittent            |  |  |
|                       | (2) Baseflow                                | -                         | MEDIUM    |                         |  |  |
|                       | (2) Flood Flow                              | —                         | MEDIUM    |                         |  |  |
|                       | (2) Streamside A                            | - Attenuation             | MEDIUM    |                         |  |  |
|                       | (3) Streamside A                            |                           |           |                         |  |  |
|                       | (4) Noodor                                  |                           |           |                         |  |  |
|                       | (4) Woode                                   | nography                  |           |                         |  |  |
|                       | (2) Stroom Stabili                          |                           |           |                         |  |  |
|                       | (3) Stream Stabil                           | ly                        |           |                         |  |  |
|                       | (4) Charline                                |                           |           |                         |  |  |
|                       | (4) Sedime                                  |                           |           |                         |  |  |
|                       | (4) Stream                                  | Geomorphology             | HIGH      |                         |  |  |
|                       | (2) Stream/Intertio                         | al Zone Interaction       | NA        |                         |  |  |
|                       |                                             | dal Flow                  | NA        |                         |  |  |
|                       | (2) Tidal Marsh Str                         | ream Stability            | NA        |                         |  |  |
|                       |                                             | arsh Channel Stability    | NA        |                         |  |  |
|                       | (3) Tidal Ma                                | arsh Stream Geomorphology | NA        |                         |  |  |
|                       | (1) Water Quality                           | _                         | LOW       |                         |  |  |
|                       | (2) Baseflow                                |                           | MEDIUM    |                         |  |  |
|                       | (2) Streamside Area Ve                      | getation                  | LOW       |                         |  |  |
|                       | (3) Upland Polluta                          | ant Filtration            | LOW       |                         |  |  |
|                       | (3) Thermoregula                            | tion                      | MEDIUM    |                         |  |  |
|                       | (2) Indicators of Stresso                   | ors                       | YES       |                         |  |  |
|                       | (2) Aquatic Life Toleran                    | ce                        | HIGH      |                         |  |  |
|                       | (2) Intertidal Zone Filtration              | วท                        | NA        |                         |  |  |
|                       | (1) Habitat                                 | =                         | LOW       |                         |  |  |
|                       | (2) In-stream Habitat                       | =                         | MEDIUM    |                         |  |  |
|                       | (3) Baseflow                                | =                         | MEDIUM    |                         |  |  |
|                       | (3) Substrate                               | =                         | MEDIUM    |                         |  |  |
|                       | (3) Stream Stabili                          | ty                        | LOW       |                         |  |  |
|                       | (3) In-stream Hab                           | pitat                     | MEDIUM    |                         |  |  |
|                       | (2) Stream-side Habitat                     | _                         | LOW       |                         |  |  |
|                       | (3) Stream-side H                           | labitat                   | LOW       |                         |  |  |
|                       | (3) Thermoregula                            | tion _                    | MEDIUM    |                         |  |  |
|                       | (2) Tidal Marsh In-stream                   | Habitat                   | NA        |                         |  |  |
|                       | (3) Flow Restriction                        | n                         | NA        |                         |  |  |
|                       | (3) Tidal Marsh Str                         | ream Stability            | NA        |                         |  |  |
|                       | (4) Tidal Ma                                | arsh Channel Stability    | NA        |                         |  |  |
|                       | (4) Tidal Ma                                | arsh Stream Geomorphology | NA        |                         |  |  |
|                       | (3) Tidal Marsh In-                         | stream Habitat            | NA        |                         |  |  |
|                       | (2) Intertidal Zone                         | -                         | NA        |                         |  |  |
|                       | Overall                                     |                           | LOW       |                         |  |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                                                                                              | NCDWR #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle, |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| and circle the location of the                                                                                                            | stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| number all reaches on the att                                                                                                             | ached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions differmation. Record in the "Neteo/Sketch" continuity in the "Neteo/Sketch" continuity in the second |  |  |  |  |
| NC SAM User Manual for exa                                                                                                                | amples of additional measurements that may be relevant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| NOTE EVIDENCE OF STRE                                                                                                                     | SSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |
| PROJECT/SITE INFORMAT                                                                                                                     | ION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| 1. Project name (if any):                                                                                                                 | Honey Mill     2. Date of evaluation:     09/05/2019                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| 3. Applicant/owner name:                                                                                                                  | NCDMS         4. Assessor name/organization:         H. Reed/ Wildlands Eng.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
| 5. County:                                                                                                                                | Surry 6. Nearest named water body                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |
| 7. River basin:                                                                                                                           | Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
|                                                                                                                                           | tenth and width can be approximations)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| 9. Site number (show on attac                                                                                                             | ched map): UT3 R2 10. Length of assessment reach evaluated (feet): 150                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |
| 11. Channel depth from bed (                                                                                                              | in riffle, if present) to top of bank (feet): 1 - 2'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| 12. Channel width at top of ba                                                                                                            | ank (feet): 4 - 7' 13. Is assessment reach a swamp steam? Yes No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |
| 14. Feature type: Perennia                                                                                                                | al flow Intermittent flow ITidal Marsh Stream                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |
| STREAM CATEGORY INFO                                                                                                                      | RMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |
| TS. NC SAM Zone.                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 16 Estimated geomorphic                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| valley shape (skip for                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| Tidal Marsh Stream):                                                                                                                      | (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| 17. Watershed size: (skip                                                                                                                 | Size 1 (< 0.1 mi <sup>2</sup> )<br>Size 2 (0.1 to < 0.5 mi <sup>2</sup> )<br>Size 3 (0.5 to < 5 mi <sup>2</sup> )<br>Size 4 (≥ 5 mi <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 18 Were regulatory consider                                                                                                               | N:<br>ations evaluated? MVes DNo. If Ves, check all that apply to the assessment area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |
| Section 10 water                                                                                                                          | Classified Trout Waters MWater Supply Watershed (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |
| Essential Fish Habitat                                                                                                                    | Primary Nursery Area High Quality Waters/Outstanding Resource Waters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| Publicly owned propert                                                                                                                    | y INCDWR Riparian buffer rule in effect INutrient Sensitive Waters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |
| Anadromous fish                                                                                                                           | □ 303(d) List □CAMA Area of Environmental Concern (AEC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| Documented presence                                                                                                                       | of a federal and/or state listed protected species within the assessment area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| Designated Critical Hal                                                                                                                   | bitat (list species)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| 19. Are additional stream info                                                                                                            | ormation/supplementary measurements included in "Notes/Sketch" section or attached?  Yes  No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 1. Channel Water – assess                                                                                                                 | ment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |
| B No flow, water in                                                                                                                       | a assessment reach.<br>a pools only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| C No water in asse                                                                                                                        | essment reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
| 2. Evidence of Flow Restric                                                                                                               | ction – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| A At least 10% of                                                                                                                         | assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| point of obstruct                                                                                                                         | ing flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |
| the assessment                                                                                                                            | reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |
| $\boxtimes B$ Not A                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 3 Feature Pattern - asses                                                                                                                 | sment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |
| $\square A$ A majority of the                                                                                                             | assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |
| B Not A                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| 4. Feature Longitudinal Pro                                                                                                               | ofile – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| A Majority of asses                                                                                                                       | ssment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| widening, active                                                                                                                          | aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |
| disturbances).                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| E Diama of Anthra Instal III                                                                                                              | tre second work work is                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |
| 5. Signs of Active Instabilit<br>Consider only current in                                                                                 | uy – assessment reach metric<br>nstability, not nast events from which the stream has currently recovered. Examples of instability include                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |
| active bank failure, active                                                                                                               | channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |
| $\Box A < 10\%$ of channel                                                                                                                | el unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |
| $\square$ B 10 to 25% of channel $\square$ C > 25% of channel                                                                             | annel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |
|                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |

#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| CONSIC |    |
|--------|----|
| LB     | RB |
| ΠA     | ΠA |
| ØВ     | ØВ |

ПС

- A Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- C Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather - watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 
Yes 
No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- A Multiple aquatic macrophytes and aquatic mosses
- (include liverworts, lichens, and algal mats) ⊠B Multiple sticks and/or leaf packs and/or emergent vegetation
- C Multiple snags and logs (including lap trees)
- D 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | F<br> G<br> H<br> J<br> K |
|------------------------------------------|---------------------------|
|------------------------------------------|---------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

|  |  |  |  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.) |
|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|--|--|--|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

11d. Tyes XNo Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)
#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1

| Adult frogs          |
|----------------------|
| Aquatic reptiles     |
| Aquatic macrophy     |
| Beetles              |
| ⊠Caddisfly larvae (1 |
| Asian clam (Corbi    |
| Crustacean (isopo    |
| Damselfly and dra    |
| Dipterans            |
| Mayfly larvae (E)    |

1

 $\Box$ 

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
- Dipterans Mayfly larvae (E)
- Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea*)
- Mussels/Clams (not Corbicula)
  - Other fish
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

| LD | IND . |                                                                                                                               |
|----|-------|-------------------------------------------------------------------------------------------------------------------------------|
| ΠA | ΠA    | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| □В | □в    | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C    | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |       | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| В | RB |
|---|----|
| A | ΠA |
| В | □В |
|   |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- В Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- □с Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ΠY
  - ×Ν Are wetlands present in the streamside area?
- ΜN ΠN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΔD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach ΔD
- Assessment reach relocated to valley edge ΠE
- ΠF None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠В Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

| 19. Buffer Width – streamside area metric (skip for Tidal Marsh Sti |
|---------------------------------------------------------------------|
|---------------------------------------------------------------------|

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.<br>Vegetated Wooded<br>_B RB LB RB<br>$\square A \square A \square A ≥ 100$ feet wide <u>or</u> extends to the edge of the watershed<br>$\square B \square B \square B \square B From 50 to < 100$ feet wide<br>$\square C \square C \square C \square C From 30 to < 50$ feet wide<br>$\square D \square D \square D \square D From 10 to < 30$ feet wide<br>$\square E \square E \square E \square E \square E \blacksquare E < 10$ feet wide <u>or</u> no trees                                                                                                                                                                                                                                                                                                                                                                         |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         _B       RB         _A       _A         _A       _A         _B       _B         _B       _B |
| 21. | Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)<br>Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is<br>within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|     | Abuts       < 30 feet       30-50 feet         _B       RB       LB       RB         _A $\square A$ $\square A$ Row crops $\square B$ $\square B$ $\square B$ $\square B$ $\square C$ $\square D$ $\square D$ $\square D$ $\square A$ $\square B$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square A$ $\square D$ $\square D$ $\square D$ $\square A$                                                                                                                                                                                                                                                                                                                                      |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).         _B       RB         ⊠A       □A       Medium to high stem density         _B       ⊠B       Low stem density         _C       □C       No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         _B       RB         △A       The total length of buffer breaks is < 25 percent.         _B       B         _B       B         _B       B         _C       The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                               |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         DA       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|     | $\square$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|     | Communities missing understory but retaining canopy trees.<br>□C IC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                                                                                                                                                                                                                                                                                                                                                                                                  |
| 25. | Conductivity – assessment reach metric (skip for all Coastal Plain streams)<br>25a.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|     | 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\Box A$ < 46 $\Box B$ 46 to < 67 $\Box C$ 67 to < 79 $\Box D$ 79 to < 230 $\Box E$ ≥ 230                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name      | Honey Mill                            | Date of Assessmen          | t 09/05/2019            | 9                     |
|-----------------------|---------------------------------------|----------------------------|-------------------------|-----------------------|
| Stream Category       | Pb1                                   | Assessor Name/Organizatior | h. Reed/ Wildlands Eng. |                       |
|                       |                                       |                            |                         |                       |
| Notes of Field Asses  | NO                                    |                            |                         |                       |
| Presence of regulate  | ory considerations (Y/N)              |                            | YES                     |                       |
| Additional stream int | formation/supplementary measu         | arements included (Y/N)    | NO NO                   |                       |
| NC SAM feature typ    | e (perennial, intermittent, Tidal )   | Marsh Stream)              | Perennial               |                       |
|                       |                                       |                            | 110 4 05/               |                       |
|                       | Function Class Bating Sum             | mary                       | USACE/                  | NCDWR<br>Intermittent |
|                       | (1) Hydrology                         |                            | MEDIUM                  | interinttent          |
|                       | (2) Baseflow                          | —                          | MEDIUM                  |                       |
|                       | (2) Flood Flow                        | —                          |                         |                       |
|                       | (2) 1 1000 1 10W<br>(3) Streamside Au | rea Attenuation            |                         |                       |
|                       | (3) Streamside A                      |                            |                         |                       |
|                       |                                       |                            |                         |                       |
|                       | (4) Woode(<br>(4) Microto             |                            |                         |                       |
|                       | (4) Microto                           |                            |                         |                       |
|                       | (3) Stream Stabil                     | lty                        |                         |                       |
|                       | (4) Chaine                            | nt Transport               |                         |                       |
|                       | (4) States                            |                            |                         |                       |
|                       | (4) Stream                            |                            | HIGH                    |                       |
|                       | (2) Stream/Intertio                   |                            | NA                      |                       |
|                       |                                       | dal Flow                   | NA                      |                       |
|                       | (2) Tidal Marsh Sti                   | ream Stability             | NA                      |                       |
|                       | (3) I Idal Ma                         | arsh Channel Stability     | NA                      |                       |
|                       | (3) Tidal Ma                          | arsh Stream Geomorphology  | NA                      |                       |
|                       | (1) Water Quality                     |                            | LOW                     |                       |
|                       | (2) Baseflow                          |                            | MEDIUM                  |                       |
|                       | (2) Streamside Area Ve                | getation                   | LOW                     |                       |
|                       | (3) Upland Polluta                    | ant Filtration             | LOW                     |                       |
|                       | (3) Thermoregula                      | tion                       | MEDIUM                  |                       |
|                       | (2) Indicators of Stresso             | ors                        | YES                     |                       |
|                       | (2) Aquatic Life Toleran              | ce                         | HIGH                    |                       |
|                       | (2) Intertidal Zone Filtration        | on                         | NA                      |                       |
|                       | (1) Habitat                           |                            | MEDIUM                  |                       |
|                       | (2) In-stream Habitat                 |                            | MEDIUM                  |                       |
|                       | (3) Baseflow                          |                            | MEDIUM                  |                       |
|                       | (3) Substrate                         |                            | MEDIUM                  |                       |
|                       | (3) Stream Stabili                    | ity                        | LOW                     |                       |
|                       | (3) In-stream Hab                     | pitat                      | MEDIUM                  |                       |
|                       | (2) Stream-side Habitat               |                            | MEDIUM                  |                       |
|                       | (3) Stream-side H                     | labitat                    | MEDIUM                  |                       |
|                       | (3) Thermoregula                      | tion                       | MEDIUM                  |                       |
|                       | (2) Tidal Marsh In-stream             | n Habitat                  | NA                      |                       |
|                       | (3) Flow Restrictio                   | n                          | NA                      |                       |
|                       | (3) Tidal Marsh Sti                   | ream Stability             | NA                      |                       |
|                       | (4) Tidal Ma                          | arsh Channel Stability     | NA                      |                       |
|                       | (4) Tidal Ma                          | arsh Stream Geomorphology  | NA                      |                       |
|                       | (3) Tidal Marsh In-                   | stream Habitat             | NA                      |                       |
|                       | (2) Intertidal Zone                   |                            | NA                      |                       |
|                       | Overall                               |                            | MEDIUM                  |                       |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify an                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed description and evaluate of requested information. Record in the "Neteo/Sketch" against if evaluation if evaluation is a separate form for each reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| NC SAM User Manual for examples of additional measurements that may be relevant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1. Project name (if any): Honey Mill 2. Date of evaluation: 09/04/2019                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3. Applicant/owner name: NCDMS 4. Assessor name/organization: K. Suggs/ Wildlands Eng.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 5. County: Surry 6. Nearest named water body                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| STRE COORDINATES (declinal degrees, at lower end of assessment reach). 30.43018, -80.01042                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9. Site number (show on attached map): UT4 10. Length of assessment reach evaluated (feet): 440                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): 3 - 5'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 12. Channel width at top of bank (feet): 10' 13. Is assessment reach a swamp steam? Yes No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 14. Feature type: 	Perennial flow 	Intermittent flow 	Tidal Marsh Stream                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| STREAM CATEGORY INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 15. NC SAM Zone: Mountains (M) Piedmont (P) Inner Coastal Plain (I) Outer Coastal Plain (O)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| $\Box A \longrightarrow \Box A \square A \longrightarrow \Box A \square A \longrightarrow \Box A \longrightarrow \Box A \longrightarrow \Box A \square A \longrightarrow \Box A \square A$ |
| Tidal Marsh Stream):       (more sinuous stream, flatter valley slope)       (less sinuous stream, steeper valley slope)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 17. Watershed size: (skip $\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5 mi <sup>2</sup> ) $\square$ Size 4 (≥ 5 mi <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| for Tidal Marsh Stream)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 18. Were regulatory considerations evaluated? XYes No If Yes, check all that apply to the assessment area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| Publicly owned property INCDWR Riparian buffer rule in effect INutrient Sensitive Waters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Anadromous fish 303(d) List CAMA Area of Environmental Concern (AEC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Documented presence of a federal and/or state listed protected species within the assessment area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| List species:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached? \[\Yes \[Xes \]No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| 1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| A Water throughout assessment reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| $\Box B$ No now, water in pools only.<br>$\Box C$ No water in assessment reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2 Evidence of Elevy Protriction - accordment reach matric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. Evidence of Flow Restriction – assessment reach metric $\Box A$ At least 10% of assessment reach in-stream babitat or riffle-pool sequence is severely affected by a flow restriction or fill to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris ja                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| beaver dams).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| 3. Feature Pattern – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| B Not A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| 4. Feature Longitudinal Prome – assessment reach metric<br>Maiority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| disturbances).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| ⋈B Not A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability inclusion of the stream of artificial band strike and artificial band strike and artificial band strike and s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| active parts randre, active channel down-cutting (nead-cut), active widening, and artificial hardening (such as concrete, gabloh, rlp-rap). $\square$ A < 10% of channel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| B 10 to 25% of channel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| C > 25% of channel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

#### Streamside Area Interaction - streamside area metric 6. (LB) and the Right Bank (RB).

| Conside | r for | the | Left | Bank |
|---------|-------|-----|------|------|
| LB      | RB    |     |      |      |

⊠A ⊡B

ПС

- ⊠A ⊡B Little or no evidence of conditions that adversely affect reference interaction
  - Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors - assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- ٦J Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes ⊠No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses  $\square A$ (include liverworts, lichens, and algal mats)
- ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ⊠C Multiple snags and logs (including lap trees)
- ΠD 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | □F<br>□G<br>□I<br>□J<br>K |
|------------------------------------------|---------------------------|
|------------------------------------------|---------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - Pool-glide section (evaluate 11d) □В
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND P C ۸

|             |  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\boxtimes$ |  |  | Artificial (rip-rap, concrete, etc.)                                                                                                                   |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - >1 Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans
- Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish Salamanders/tadpoles
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

| LB | RB |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ΠA | ΠA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| □в | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

| B  | RB |
|----|----|
| A  | ΠA |
| ]В | □в |
|    |    |

- Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
- В Majority of streamside area with depressions able to pond water 3 to 6 inches deep
- □C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach.

- LB ×Ν
  - RB ΠY
    - ΜN
- Are wetlands present in the streamside area?
- ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΔD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ĒΕ Stream bed or bank soil reduced (dig through deposited sediment if present)
- ΠF None of the above

### 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- ΠE Assessment reach relocated to valley edge
- ⊠F None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

Consider aspect. Consider "leaf-on" condition.

- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- Degraded (example: scattered trees) ⊟в
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break           Vegetated         Wo           LB         RB         LB           \[A] A         \[A] A         \[A]           \[B] B         \[B] B         \[B]           \[C] C         \[C] C         \[C]           \[D] D         \[D]         \[D]           \[E] E         \[E] E         \[E] E | A       A       ≥ 100 feet wide or extends to the edge of the watershed         B       A $\angle A$ ≥ 100 feet wide or extends to the edge of the watershed         B       B       From 50 to < 100 feet wide         C       C       From 30 to < 50 feet wide         D       D       From 10 to < 30 feet wide         E       E       < 10 feet wide or no trees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure           Consider for left           LB         RB           ⊠A         ⊠A           □B         □B           □C         □C           □D         □D           □E         □E                                                                                                                          | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)<br/>bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> <li>Mature forest<br/>Non-mature woody vegetation <u>or</u> modified vegetation structure<br/>Herbaceous vegetation with or without a strip of trees &lt; 10 feet wide<br/>Maintained shrubs<br/>Little or no vegetation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 21. | Buffer StressorsCheck all appropriationwithin 30 feet of sIf none of the folAbuts< 3LBRBLBAABBBCCCØDDØD                                                                                                                                                                                                               | <ul> <li>s - streamside area metric (skip for Tidal Marsh Streams)</li> <li>briate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is tream (&lt; 30 feet), or is between 30 to 50 feet of stream (30-50 feet).</li> <li>lowing stressors occurs on either bank, check here and skip to Metric 22:</li> <li>0 feet 30-50 feet</li> <li>RB LB RB</li> <li>A A A A A Row crops</li> <li>B B B Maintained turf</li> <li>C C C C C Pasture (no livestock)/commercial horticulture</li> <li>D D D D D D Pasture (active livestock use)</li> </ul>                                                                                                                                                                                                                                                                                                     |
| 22. | Stem Density – s         Consider for left         LB       RB         ⊠A       ⊠A         □B       □B         □C       □C                                                                                                                                                                                            | streamside area metric (skip for Tidal Marsh Streams)<br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 23. | Continuity of VeConsider whetherLBRB $\square A$ $\square A$ $\square B$ $\square B$ $\square C$ $\square C$                                                                                                                                                                                                          | getated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 24. | Vegetative Comµ<br>Evaluate the dom<br>assessment react<br>LB RB<br>□A ⊠A                                                                                                                                                                                                                                             | bosition – streamside area metric (skip for Tidal Marsh Streams)<br>inant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>in habitat.<br>Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,<br>with non-native invasive species absent or sparse                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|     | ⊠в ⊡в                                                                                                                                                                                                                                                                                                                 | Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing <u>or</u> communities with non-native invasive species present, but not dominant, over a large portion of the expected strata <u>or</u> communities missing understory but retaining canopy trees. Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation. |
| 25. | Conductivity – a<br>25a. □Yes ⊠<br>If No, selec                                                                                                                                                                                                                                                                       | ssessment reach metric (skip for all Coastal Plain streams)<br>No Was conductivity measurement recorded?<br>t one of the following reasons.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|     | 25b. Check the t<br>□A < 46                                                                                                                                                                                                                                                                                           | box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square B$ 46 to < 67 $\square C$ 67 to < 79 $\square D$ 79 to < 230 $\square E \ge 230$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                        | Honey Mill                           | Date of Assessmer          | nt 09/04/2019 | )              |
|-------------------------------------------------------------------------|--------------------------------------|----------------------------|---------------|----------------|
| Stream Category                                                         | Pb1                                  | Assessor Name/Organization | n K. Suggs/   | Wildlands Eng. |
|                                                                         |                                      |                            |               |                |
| Notes of Field Asses                                                    | ssment Form (Y/N)                    |                            | NO            |                |
| Presence of regulate                                                    | ory considerations (Y/N)             |                            | YES           |                |
| Additional stream information/supplementary measurements included (Y/N) |                                      |                            | <u> </u>      |                |
| NC SAM feature typ                                                      | e (perennial, intermittent, 1 idal N | larsh Stream)              | Perennial     |                |
|                                                                         |                                      |                            |               |                |
|                                                                         | Function Class Rating Summ           | nary                       | All Streams   | Intermittent   |
|                                                                         | (1) Hydrology                        |                            | HIGH          | Internet       |
|                                                                         | (2) Baseflow                         | —                          | HIGH          |                |
|                                                                         | (2) Flood Flow                       | —                          | HIGH          |                |
|                                                                         | (3) Streamside Ar                    | ea Attenuation             | HIGH          |                |
|                                                                         | (d) Floodpla                         | ain Access                 | HIGH          |                |
|                                                                         | (1) Noodec                           | Rinarian Buffer            | нісн          |                |
|                                                                         | (4) Woodee<br>(4) Microtor           | ography                    | NA            |                |
|                                                                         | (3) Stream Stabili                   |                            | НСН           |                |
|                                                                         |                                      | y                          | НІСН          |                |
|                                                                         | (4) Chaime                           | t Transport                |               |                |
|                                                                         | (4) Stroom                           |                            |               |                |
|                                                                         | (2) Stream/Intertic                  | al Zono Interaction        | NA            |                |
|                                                                         | (2) Longitudinal Tic                 |                            |               |                |
|                                                                         | (2) Eoligitudinal Tic                | an Flow                    |               |                |
|                                                                         | (2) Tidai Marsh Su<br>(2) Tidai Ma   | eam Stability              |               |                |
|                                                                         | (S) Tidai Ma                         |                            |               |                |
|                                                                         | (3) Ildal Ma                         | rsh Stream Geomorphology   |               |                |
|                                                                         | (1) water Quality                    | —                          | MEDIUM        |                |
|                                                                         | (2) Basellow                         |                            | HIGH          |                |
|                                                                         | (2) Streamside Area Ve               |                            | MEDIUM        |                |
|                                                                         | (3) Upland Polluta                   |                            | LOW           |                |
|                                                                         | (3) Thermoregulat                    | ion                        | HIGH          |                |
|                                                                         | (2) Indicators of Stresso            | rs                         | YES           |                |
|                                                                         | (2) Aquatic Life Tolerand            |                            | HIGH          |                |
|                                                                         | (2) Intertidal Zone Filtratio        | n                          | NA            |                |
|                                                                         | (1) Habitat                          | _                          | HIGH          |                |
|                                                                         | (2) In-stream Habitat                | _                          | HIGH          |                |
|                                                                         | (3) Baseflow                         | _                          | HIGH          |                |
|                                                                         | (3) Substrate                        | _                          | HIGH          |                |
|                                                                         | (3) Stream Stabili                   |                            | HIGH          |                |
|                                                                         | (3) In-stream Hab                    | itat                       | HIGH          |                |
|                                                                         | (2) Stream-side Habitat              |                            | HIGH          |                |
|                                                                         | (3) Stream-side H                    | abitat                     | HIGH          |                |
|                                                                         | (3) Thermoregulat                    | ion                        | HIGH          |                |
|                                                                         | (2) Tidal Marsh In-stream            | Habitat                    | NA            |                |
|                                                                         | (3) Flow Restriction                 | ו <u> </u>                 | NA            |                |
|                                                                         | (3) Tidal Marsh Str                  | eam Stability              | NA            |                |
|                                                                         | (4) Tidal Ma                         | rsh Channel Stability      | NA            |                |
|                                                                         | (4) Tidal Ma                         | rsh Stream Geomorphology   | NA            |                |
|                                                                         | (3) Tidal Marsh In-                  | stream Habitat             | NA            |                |
|                                                                         | (2) Intertidal Zone                  | —                          | NA            |                |
|                                                                         | Overall                              |                            | HIGH          |                |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                          | · ·                                          | NCDWR #:                                                |                                                   |
|-------------------------------------------------------|----------------------------------------------|---------------------------------------------------------|---------------------------------------------------|
| INSTRUCTIONS: Attach a sk                             | etch of the assessment area and ph           | otographs. Attach a copy of the USGS                    | 7.5-minute topographic quadrangle,                |
| and circle the location of the s                      | tream reach under evaluation. If m           | ultiple stream reaches will be evaluated                | on the same property, identify and                |
| number all reaches on the atta                        | ched map, and include a separate to          | orm for each reach. See the NC SAM L                    | user Manual for detailed descriptions             |
| NC SAM User Manual for exa                            | mples of additional measurements t           | hat may be relevant.                                    | diements were penormed. See the                   |
| NOTE EVIDENCE OF STRES                                | SORS AFFECTING THE ASSESS                    | MENT AREA (do not need to be withi                      | n the assessment area).                           |
| PROJECT/SITE INFORMATION                              | DN:                                          |                                                         |                                                   |
| 1. Project name (if any):                             | Honey Mill                                   | 2. Date of evaluation: 09/04/2                          | 2019                                              |
| 3. Applicant/owner name:                              | NCDMS                                        | 4. Assessor name/organization:                          | K. Suggs/ Wildlands Eng.                          |
| 5. County:                                            | Surry                                        | 6. Nearest named water body                             | Areret Diver                                      |
| 8 Site coordinates (decimal d                         |                                              | reach): 36.431343 -80.608299                            |                                                   |
| STREAM INFORMATION: (d)                               | epth and width can be approximate            | tions)                                                  |                                                   |
| 9. Site number (show on attac                         | hed map): UT5                                | 10. Length of assessment reach evalu                    | lated (feet): 320                                 |
| 11. Channel depth from bed (i                         | n riffle, if present) to top of bank (fee    | et): <u>2'</u>                                          | Inable to assess channel depth.                   |
| 12. Channel width at top of ba                        | nk (feet): <u>6 - 10'</u> 1                  | 3. Is assessment reach a swamp stean                    | n? □Yes □No                                       |
| 14. Feature type: Perennia                            |                                              | larsh Stream                                            |                                                   |
| 15 NC SAM Zone                                        | $\square Mountains (M) \qquad \square Piedm$ | ont (P)                                                 | Outer Coastal Plain (O)                           |
|                                                       |                                              |                                                         |                                                   |
|                                                       |                                              |                                                         |                                                   |
| 16. Estimated geomorphic                              |                                              |                                                         |                                                   |
| valley shape ( <b>skip for</b>                        |                                              | ⊠B                                                      |                                                   |
| Tidal Marsh Stream):                                  | (more sinuous stream, flatter val            | ley slope) (less sinuous st                             | ream, steeper valley slope)                       |
| 17. Watershed size: (skip                             | ⊠Size 1 (< 0.1 mi²)                          | $(0.1 \text{ to } < 0.5 \text{ mi}^2)$ Size 3 (0.5 to < | ≤ 5 mi²)                                          |
|                                                       | 1.                                           |                                                         |                                                   |
| 18. Were regulatory considera                         | itions evaluated? ⊠Yes ⊟No_If Y              | es, check all that apply to the assessme                | ent area.                                         |
| Section 10 water                                      | Classified Trout Waters                      | Water Supply Wate                                       | rshed (□I □II □III ⊠IV □V)                        |
| Essential Fish Habitat                                | Primary Nursery Area                         | 🔲 High Quality Water                                    | s/Outstanding Resource Waters                     |
| Publicly owned property                               | / UNCDWR Riparian buffe                      | r rule in effect UNutrient Sensitive V                  | Vaters                                            |
|                                                       | of a federal and/or state listed prote       |                                                         | ronmental Concern (AEC)                           |
| List species:                                         |                                              |                                                         |                                                   |
| Designated Critical Hab                               | itat (list species)                          |                                                         |                                                   |
| 19. Are additional stream infor                       | mation/supplementary measuremer              | nts included in "Notes/Sketch" section of               | r attached? □Yes ⊠No                              |
| 1 Channel Water - assess                              | ment reach metric (skin for Size 1           | strooms and Tidal Marsh Strooms)                        |                                                   |
| $\square A$ Water throughou                           | t assessment reach.                          | Sileans and ridar marsh Sileans                         |                                                   |
| B No flow, water in                                   | pools only.                                  |                                                         |                                                   |
| C No water in asse                                    | ssment reach.                                |                                                         |                                                   |
| 2. Evidence of Flow Restric                           | tion – assessment reach metric               |                                                         |                                                   |
| A At least 10% of a                                   | assessment reach in-stream habitat           | or riffle-pool sequence is severely affe                | ected by a flow restriction <u>or</u> fill to the |
| the assessment i                                      | each (examples: undersized or per            | ched culverts, causeways that constrict                 | the channel, tidal gates, debris jams,            |
| beaver dams).                                         |                                              |                                                         |                                                   |
| ⊠B Not A                                              |                                              |                                                         |                                                   |
| 3. Feature Pattern – assess                           | ment reach metric                            |                                                         |                                                   |
| A majority of the                                     | assessment reach has altered patte           | rn (examples: straightening, modificatio                | n above or below culvert).                        |
|                                                       |                                              |                                                         |                                                   |
| 4. Feature Longitudinal Pro                           | file – assessment reach metric               |                                                         |                                                   |
| widening active                                       | aggradation, dredging, and excava            | tion where appropriate channel profile                  | has not reformed from any of these                |
| disturbances).                                        |                                              |                                                         |                                                   |
| B Not A                                               |                                              |                                                         |                                                   |
| 5. Signs of Active Instability                        | y – assessment reach metric                  |                                                         |                                                   |
| Consider only current in                              | stability, not past events from w            | hich the stream has currently recove                    | ered. Examples of instability include             |
| active bank failure, active $\propto 10\%$ of channel | nannel down-cutting (head-cut), act          | tive widening, and artificial hardening (s              | uch as concrete, gabion, rip-rap).                |
| $\square$ B 10 to 25% of cha                          | nnel unstable                                |                                                         |                                                   |
| C > 25% of channe                                     | l unstable                                   |                                                         |                                                   |

#### Streamside Area Interaction - streamside area metric 6. (LB) and the Right Bank (RB).

| Consid | ier for | the | Left | Bank |
|--------|---------|-----|------|------|
| LB     | RB      |     |      |      |

⊠A ⊡B

ПС

- ⊠A ⊡B Little or no evidence of conditions that adversely affect reference interaction
  - Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ПС Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors - assessment reach/intertidal zone metric

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠA
- Excessive sedimentation (burying of stream features or intertidal zone) Πв
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" DE section.
- ⊠F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- ΠJ Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 🛛 Yes ⊠No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses  $\square A$ (include liverworts, lichens, and algal mats)
- ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ⊠C Multiple snags and logs (including lap trees)
- ΠD 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Ti<br>Marsh Strea<br>Only<br>Only<br>A C I H O | Gor Tidal<br>Streams<br>H□ B□<br>H□ |
|----------------------------------------------------------|-------------------------------------|
|----------------------------------------------------------|-------------------------------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - Pool-glide section (evaluate 11d) □В
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. ND P C ۸

|             |  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|-------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| $\boxtimes$ |  |  | Artificial (rip-rap, concrete, etc.)                                                                                                                   |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs
    - Aquatic reptiles
      - Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
    - Beetles
    - Caddisfly larvae (T)
    - Asian clam (Corbicula)
    - Crustacean (isopod/amphipod/cravfish/shrimp)
    - Damselfly and dragonfly larvae
    - Dipterans
    - Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
    - Midges/mosquito larvae
    - Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
  - Mussels/Clams (not Corbicula)
    - Other fish
    - Snails
    - Stonefly larvae (P)
    - Tipulid larvae
    - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

1

| LB | RB |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| ΜA | ΜA | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| □в | □в | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| ШC | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ΠY
  - ×Ν Are wetlands present in the streamside area?
- ΜN ΠN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- D Evidence of bank seepage or sweating (iron in water indicates seepage)
- ΠE Stream bed or bank soil reduced (dig through deposited sediment if present)
- ΠF None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

- Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA
- □в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)
- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- ΠE Assessment reach relocated to valley edge
- ⊠F None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- □в Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLBRBLBRBAA $A \ge 100$ feet wide or extends to the edge of the watershedBBBBCCCCCFrom 30 to < 50 feet wide $A \supseteq D$ DDDFrom 10 to < 30 feet wide $A \supseteq E$ E $A \supseteq E$ $A \supseteq E \supseteq E \subseteq E$ |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         A       A         B       B         Non-mature woody vegetation or modified vegetation structure         C       C         Herbaceous vegetation with or without a strip of trees < 10 feet wide         D       D         Maintained shrubs         E       E                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 21. | Buffer Stressors - streamside area metric (skip for Tidal Marsh Streams)         Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:         Abuts       < 30 feet         Abuts       < 30 feet         B       RB       LB         RB       B       B         B       B       B         B       B       B         B       B       B         B       B       B         B       B       B         B       B       B         B       B       B         C       C       C         D       D       D         D       D       D                                                                                                                                    |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).         LB       RB         △A       △A         Medium to high stem density         □B       □B         □C       □C         No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         LB       RB         A       A         The total length of buffer breaks is < 25 percent.         B       B         The total length of buffer breaks is between 25 and 50 percent.         C       C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         ⊠A       ⊠A         Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       □B         □B       □B         ∨egetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities missing understory but retaining canopy trees.                                                                                                                |
| 25. | <ul> <li>□C □C □C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.</li> <li>Conductivity – assessment reach metric (skip for all Coastal Plain streams)</li> <li>25a. □Yes ⊠No Was conductivity measurement recorded?</li> </ul>                                                                                                                                                                                                                                                                                                                                                                           |
|     | If No, select one of the following reasons. $\Box$ No Water $\Box$ Other:<br>25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\Box A < 46 \qquad \Box B  46 \text{ to } < 67 \qquad \Box C  67 \text{ to } < 79 \qquad \Box D  79 \text{ to } < 230 \qquad \Box E \geq 230$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                  | Honey Mill                         | Date of Assessment         |                          | 09/04/2019   |  |
|-------------------------------------------------------------------|------------------------------------|----------------------------|--------------------------|--------------|--|
| Stream Category                                                   | Pb1                                | Assessor Name/Organization | K. Suggs/ Wildlands Eng. |              |  |
|                                                                   |                                    |                            |                          |              |  |
|                                                                   | ssment Form (Y/N)                  |                            |                          |              |  |
| Additional stream in                                              | formation/aupplementary massi      | remente included (V/N)     |                          |              |  |
| NC SAM feature type (nerennial, intermittent, Tidal Marsh Stream) |                                    |                            | Boroppial                |              |  |
| NC SAM leature typ                                                | e (perenniai, internittent, ridari | varsh Sueam)               | Ferenniai                |              |  |
|                                                                   |                                    |                            | USACE/                   | NCDWR        |  |
|                                                                   | Function Class Rating Summ         | nary                       | All Streams              | Intermittent |  |
|                                                                   | (1) Hydrology                      | -                          | HIGH                     |              |  |
|                                                                   | (2) Baseflow                       |                            | HIGH                     |              |  |
|                                                                   | (2) Flood Flow                     |                            | HIGH                     |              |  |
|                                                                   | (3) Streamside Ar                  | ea Attenuation             | HIGH                     |              |  |
|                                                                   | (4) Floodpla                       | ain Access                 | HIGH                     |              |  |
|                                                                   | (4) Wooded                         | Riparian Buffer            | HIGH                     |              |  |
|                                                                   | (4) Microtor                       | ography                    | NA                       |              |  |
|                                                                   | (3) Stream Stabili                 | ty <u> </u>                | HIGH                     |              |  |
|                                                                   | (4) Channe                         | l Stability                | HIGH                     |              |  |
|                                                                   | (4) Sedime                         | nt Transport               | HIGH                     |              |  |
|                                                                   | (4) Stream                         | Geomorphology              | HIGH                     |              |  |
|                                                                   | (2) Stream/Intertio                | al Zone Interaction        | NA                       |              |  |
|                                                                   | (2) Longitudinal Tic               | al Flow                    | NA                       |              |  |
|                                                                   | (2) Tidal Marsh Str                | eam Stability              | NA                       |              |  |
|                                                                   | (3) Tidal Ma                       | rsh Channel Stability      | NA                       |              |  |
|                                                                   | (3) Tidal Ma                       | rsh Stream Geomorphology   | NA                       |              |  |
|                                                                   | (1) Water Quality                  |                            | MEDIUM                   |              |  |
|                                                                   | (2) Baseflow                       |                            | HIGH                     |              |  |
|                                                                   | (2) Streamside Area Veo            |                            | HIGH                     |              |  |
|                                                                   | (3) Upland Polluta                 | Int Filtration             | HIGH                     |              |  |
|                                                                   | (3) Thermoregula                   |                            | HIGH                     |              |  |
|                                                                   | (2) Indicators of Stresso          | rs                         | YES                      |              |  |
|                                                                   | (2) Aquatic Life Tolerand          |                            | HIGH                     |              |  |
|                                                                   | (2) Intertidal Zone Filtratio      | on                         | NA                       |              |  |
|                                                                   | (1) Habitat                        |                            | HIGH                     |              |  |
|                                                                   | (2) In-stream Habitat              | —                          | HIGH                     |              |  |
|                                                                   | (3) Baseflow                       |                            | HIGH                     |              |  |
|                                                                   | (3) Substrate                      | —                          | HIGH                     |              |  |
|                                                                   | (3) Stream Stabili                 |                            | HIGH                     |              |  |
|                                                                   | (3) In-stream Hab                  | itat                       | HIGH                     |              |  |
|                                                                   | (2) Stream-side Habitat            |                            | HIGH                     |              |  |
|                                                                   | (3) Stream-side H                  | abitat                     | HIGH                     |              |  |
|                                                                   | (3) Thermoregula                   | tion                       | HIGH                     |              |  |
|                                                                   | (2) Tidal Marsh In-stream          | <br>Habitat                | NA                       |              |  |
|                                                                   | (3) Flow Restriction               | <u></u>                    | NA                       |              |  |
|                                                                   | (3) Tidal March Str                | eam Stability              | NA                       |              |  |
|                                                                   | (3) Tidai Warsh Su<br>(4) Tidal Ma | rsh Channel Stability      | NA                       |              |  |
|                                                                   | (4) Tidal Ma                       | rsh Stream Geomorphology   | NA                       |              |  |
|                                                                   | (4) Iual Ma<br>⊾u dereM lehiT (2)  | stream Habitat             | NΔ                       |              |  |
|                                                                   | (2) Intertidal Zone                | <u> </u>                   | NΔ                       |              |  |
|                                                                   |                                    |                            | HIGH                     |              |  |
|                                                                   |                                    |                            | non                      |              |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                                                                                              | · ·                                                                   | NCDWR #:                                         |                                          |  |  |  |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------|------------------------------------------|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle, |                                                                       |                                                  |                                          |  |  |  |
| and circle the location of the stream                                                                                                     | n reach under evaluation. If multiple                                 | stream reaches will be evaluated                 | on the same property, identify and       |  |  |  |
| number all reaches on the attached                                                                                                        | map, and include a separate form for                                  | each reach. See the NC SAM Us                    | er Manual for detailed descriptions      |  |  |  |
| and explanations of requested infor                                                                                                       | mation. Record in the "Notes/Sketch                                   | " section if supplementary measured              | rements were performed. See the          |  |  |  |
| NC SAM User Manual for examples<br>NOTE EVIDENCE OF STRESSOR                                                                              | s of additional measurements that may<br>S AFFECTING THE ASSESSMENT , | y be relevant.<br>AREA (do not need to be within | the assessment area).                    |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                 |                                                                       |                                                  |                                          |  |  |  |
| 1. Project name (if any): Hone                                                                                                            | ey Mill 2                                                             | 2. Date of evaluation: 09/05/20                  | 019                                      |  |  |  |
| 3. Applicant/owner name: NCD                                                                                                              | DMS 4                                                                 | 1. Assessor name/organization:                   | K. Suggs/ Wildlands Eng.                 |  |  |  |
| 5. County: Surry                                                                                                                          | <u>y</u> (                                                            | 6. Nearest named water body                      |                                          |  |  |  |
| 7. River basin: Yadi                                                                                                                      | <u>kin</u>                                                            | on USGS 7.5-minute quad:                         | Ararat River                             |  |  |  |
| 8. Site coordinates (decimal degree                                                                                                       | s, at lower end of assessment reach)                                  | 36.432976, -80.60758                             |                                          |  |  |  |
| 9. Site number (show on attached m                                                                                                        | and width can be approximations)<br>nap): <u>UT6 R1</u> 10. Le        | ength of assessment reach evalua                 | ted (feet): <u>300</u>                   |  |  |  |
| 11. Channel depth from bed (in riffle                                                                                                     | e, if present) to top of bank (feet):                                 | 2'Ur                                             | hable to assess channel depth.           |  |  |  |
| 12. Channel width at top of bank (fe                                                                                                      | et): <u>6'</u> 13. Is as                                              | ssessment reach a swamp steam?                   | P □Yes □No                               |  |  |  |
| 14. Feature type: Perennial flow                                                                                                          | ☐Intermittent flow ☐Tidal Marsh S                                     | tream                                            |                                          |  |  |  |
| STREAM CATEGORY INFORMAT                                                                                                                  | ION:                                                                  |                                                  |                                          |  |  |  |
| 15. NC SAM Zone:                                                                                                                          | J Mountains (M) 🛛 🖾 Piedmont (P)                                      | ∐ Inner Coastal Plain (I)                        | ∐ Outer Coastal Plain (O)                |  |  |  |
|                                                                                                                                           |                                                                       | N                                                |                                          |  |  |  |
|                                                                                                                                           |                                                                       |                                                  |                                          |  |  |  |
| 16. Estimated geomorphic                                                                                                                  |                                                                       |                                                  | r                                        |  |  |  |
| valley shape (skip for                                                                                                                    |                                                                       |                                                  |                                          |  |  |  |
| I Idal Marsh Stream): (m                                                                                                                  | nore sinuous stream, flatter valley slop                              | be) (less sinuous stre                           | eam, steeper valley slope)               |  |  |  |
| 17. Watershed size: (skip                                                                                                                 | ]Size 1 (< 0.1 mi²) □Size 2 (0.1 to                                   | o < 0.5 mi²) □Size 3 (0.5 to < 5                 | 5 mi²)                                   |  |  |  |
| for Tidal Marsh Stream)                                                                                                                   |                                                                       |                                                  |                                          |  |  |  |
| ADDITIONAL INFORMATION:                                                                                                                   |                                                                       |                                                  | 4                                        |  |  |  |
|                                                                                                                                           |                                                                       | Water Supply Water                               |                                          |  |  |  |
| Section To water                                                                                                                          |                                                                       | High Quality Waters                              |                                          |  |  |  |
|                                                                                                                                           |                                                                       | effect Nutrient Sensitive Wa                     | outstanding Resource Waters              |  |  |  |
|                                                                                                                                           | $\square$ 303(d) List                                                 |                                                  | nmental Concern (AFC)                    |  |  |  |
| Documented presence of a fe                                                                                                               | ederal and/or state listed protected sp                               | ecies within the assessment area.                |                                          |  |  |  |
| List species:                                                                                                                             |                                                                       |                                                  |                                          |  |  |  |
| Designated Critical Habitat (li                                                                                                           | ist species)                                                          |                                                  |                                          |  |  |  |
| 19. Are additional stream informatio                                                                                                      | on/supplementary measurements inclu                                   | uded in "Notes/Sketch" section or a              | attached? □Yes ⊠No                       |  |  |  |
| 1 Channel Water - assessment                                                                                                              | roach motric (skin for Sizo 1 stroan                                  | e and Tidal March Stroame)                       |                                          |  |  |  |
| $\square$ Water throughout asse                                                                                                           | essment reach.                                                        |                                                  |                                          |  |  |  |
| $\square$ B No flow, water in pools                                                                                                       | s only.                                                               |                                                  |                                          |  |  |  |
| C No water in assessmer                                                                                                                   | nt reach.                                                             |                                                  |                                          |  |  |  |
| 2 Evidence of Flow Restriction -                                                                                                          | - assessment reach metric                                             |                                                  |                                          |  |  |  |
| $\Box A$ At least 10% of assess                                                                                                           | sment reach in-stream habitat or riffle                               | e-pool sequence is severely affect               | ted by a flow restriction or fill to the |  |  |  |
| point of obstructing flo                                                                                                                  | w or a channel choked with aquatic r                                  | nacrophytes or ponded water or i                 | mpoundment on flood or ebb within        |  |  |  |
| the assessment reach                                                                                                                      | (examples: undersized or perched cr                                   | ulverts, causeways that constrict th             | ne channel, tidal gates, debris jams,    |  |  |  |
| beaver dams).                                                                                                                             |                                                                       |                                                  |                                          |  |  |  |
| ⊠B Not A                                                                                                                                  |                                                                       |                                                  |                                          |  |  |  |
| 3. Feature Pattern – assessment                                                                                                           | reach metric                                                          |                                                  |                                          |  |  |  |
| ☐A A majority of the asses                                                                                                                | ssment reach has altered pattern (exa                                 | mples: straightening, modification               | above or below culvert).                 |  |  |  |
| ⊠B Not A                                                                                                                                  |                                                                       |                                                  |                                          |  |  |  |
| 4. Feature Longitudinal Profile –                                                                                                         | assessment reach metric                                               |                                                  |                                          |  |  |  |
| □A Majority of assessment                                                                                                                 | t reach has a substantially altered str                               | eam profile (examples: channel de                | own-cutting, existing damming, over      |  |  |  |
| widening, active aggra                                                                                                                    | adation, dredging, and excavation wh                                  | nere appropriate channel profile h               | as not reformed from any of these        |  |  |  |
| disturbances).                                                                                                                            |                                                                       |                                                  |                                          |  |  |  |
| ⊠B Not A                                                                                                                                  |                                                                       |                                                  |                                          |  |  |  |
| 5. Signs of Active Instability - as                                                                                                       | ssessment reach metric                                                |                                                  |                                          |  |  |  |
| Consider only current instabil                                                                                                            | lity, not past events from which th                                   | e stream has currently recover                   | ed. Examples of instability include      |  |  |  |
| active bank failure, active chann                                                                                                         | el down-cutting (head-cut), active wid                                | lening, and artificial hardening (su             | ch as concrete, gabion, rip-rap).        |  |  |  |
| A < 10% of channel unsta                                                                                                                  | able                                                                  |                                                  |                                          |  |  |  |
| □B 10 to 25% of channel u                                                                                                                 | unstable                                                              |                                                  |                                          |  |  |  |

C > 25% of channel unstable

#### 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| Consi | der for | the | Left | Bank | (L |
|-------|---------|-----|------|------|----|
| LB    | RB      |     |      |      |    |

- Little or no evidence of conditions that adversely affect reference interaction Moderate evidence of conditions (examples: berms, levees, down-cutting, a
  - B Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

⊠A ⊡B

ПС

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather – watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 
Yes 
No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Multiple sticks and/or leaf packs and/or emergent vegetation
   Multiple snags and logs (including lap trees)
- D 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only ☐<br>Marsh 2 Check<br>Marsh |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

|  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.) |
|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  |                                                                                                                                                                                                |

11d. Tyes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes □No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans Mayfly larvae (E)
- Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
- Mussels/Clams (not Corbicula)
  - Other fish Salamanders/tadpoles
  - Snails
  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

- Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. RB LB
  - ⊠Α ⊠Α Little or no alteration to water storage capacity over a majority of the streamside area ⊡в ⊡в Moderate alteration to water storage capacity over a majority of the streamside area ПС Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)

#### 14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в ⊡в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

## Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΜD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ⊠Ε Stream bed or bank soil reduced (dig through deposited sediment if present)
- ΠF None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

### Check all that apply.

Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA

□в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)

- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- Assessment reach relocated to valley edge ΠE
- ⊠F None of the above

### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- $\square A$ Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ΠВ Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWooLBRB $\square A$ $\square A$ $\square B$ $\square B$ $\square C$ $\square C$ $\square D$ $\square D$ $\square E$ $\square E$          | boded<br>RB<br>$\square \square $                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 20. | Buffer Structure -         Consider for left         LB       RB         □A       ⊠A         □B       □B         □C       □C         □D       □D         □E       □E | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)</li> <li>bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> <li>Mature forest</li> <li>Non-mature woody vegetation <u>or</u> modified vegetation structure</li> <li>Herbaceous vegetation with or without a strip of trees &lt; 10 feet wide</li> <li>Maintained shrubs</li> <li>Little or no vegetation</li> </ul>                                                                                                                                                                                                                       |
| 21. | Buffer Stressors<br>Check all approp<br>within 30 feet of st<br>If none of the foll<br>Abuts < 30<br>LB RB LB<br>A A A A<br>B B B B<br>C C C C<br>D D D              | <ul> <li>streamside area metric (skip for Tidal Marsh Streams)</li> <li>riate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is ream (&lt; 30 feet), or is between 30 to 50 feet of stream (30-50 feet).</li> <li>owing stressors occurs on either bank, check here and skip to Metric 22: </li> <li>) feet 30-50 feet</li> <li>RB LB RB</li> <li>A A A Row crops</li> <li>B B B Maintained turf</li> <li>C C C C Pasture (no livestock)/commercial horticulture</li> <li>D D D D Pasture (active livestock use)</li> </ul>                                     |
| 22. | Stem Density – sConsider for leftLBRBAABBCC                                                                                                                          | <b>treamside area metric (skip for Tidal Marsh Streams)</b><br>bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>Medium to high stem density<br>Low stem density<br>No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                               |
| 23. | Continuity of Veg<br>Consider whether<br>LB RB<br>⊠A ⊠A<br>□B □B<br>□C □C                                                                                            | yetated Buffer – streamside area metric (skip for Tidal Marsh Streams)<br>vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.<br>The total length of buffer breaks is < 25 percent.<br>The total length of buffer breaks is between 25 and 50 percent.<br>The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                               |
| 24. | Vegetative Comp         Evaluate the domi         assessment reach         LB       RB         □A       □A         □B       □B                                       | osition – streamside area metric (skip for Tidal Marsh Streams)<br>nant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>habitat.<br>Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,<br>with non-native invasive species absent or sparse.<br>Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native<br>species. This may include communities of weedy native species that develop after clear-cutting or clearing or |
|     | ⊠c ⊡c                                                                                                                                                                | communities with non-native invasive species present, but not dominant, over a large portion of the expected strata <u>or</u> communities missing understory but retaining canopy trees.<br>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.                                              |
| 25. | Conductivity – as<br>25a. □Yes ⊠<br>If No, select                                                                                                                    | Sessment reach metric (skip for all Coastal Plain streams) No Was conductivity measurement recorded? one of the following reasons.  No Water  Other:                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|     | 25b. Check the b<br>$\Box A < 46$                                                                                                                                    | ox corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square B$ 46 to < 67 $\square C$ 67 to < 79 $\square D$ 79 to < 230 $\square E \ge 230$                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name                                                        | Honey Mill                          | Date of Assessment       |                | 09/05/2019   |  |
|-------------------------------------------------------------------------|-------------------------------------|--------------------------|----------------|--------------|--|
| Stream Category                                                         | Assessor Name/Organization          | n K. Suggs/              | Wildlands Eng. |              |  |
|                                                                         |                                     |                          |                |              |  |
| Notes of Field Asses                                                    | ssment Form (Y/N)                   |                          | NO             |              |  |
| Presence of regulate                                                    | ory considerations (Y/N)            |                          | YES            |              |  |
| Additional stream information/supplementary measurements included (Y/N) |                                     |                          | NU             |              |  |
| NC SAM leature typ                                                      | e (perenniai, intermittent, Tidai k | harsh Sueam)             | Perenniai      |              |  |
|                                                                         |                                     |                          | USACE/         | NCDWR        |  |
|                                                                         | Function Class Rating Sumn          | nary A                   | All Streams    | Intermittent |  |
|                                                                         | (1) Hydrology                       |                          | HIGH           |              |  |
|                                                                         | (2) Baseflow                        |                          | HIGH           |              |  |
|                                                                         | (2) Flood Flow                      |                          | HIGH           |              |  |
|                                                                         | (3) Streamside Ar                   | ea Attenuation           | HIGH           |              |  |
|                                                                         | (4) Floodpla                        | in Access                | HIGH           |              |  |
|                                                                         | (4) Wooded                          | Riparian Buffer          | MEDIUM         |              |  |
|                                                                         | (4) Microtop                        | ography                  | NA             |              |  |
|                                                                         | (3) Stream Stabilit                 | у                        | HIGH           |              |  |
|                                                                         | (4) Channel                         | <br>Stability            | HIGH           |              |  |
|                                                                         | (4) Sedimer                         | nt Transport             | MEDIUM         |              |  |
|                                                                         | (4) Stream                          | Geomorphology            | HIGH           |              |  |
|                                                                         | (2) Stream/Intertid                 | al Zone Interaction      | NA             |              |  |
|                                                                         | (2) Longitudinal Tid                | al Flow                  | NA             |              |  |
|                                                                         | (2) Tidal Marsh Str                 | eam Stability            | NA             |              |  |
|                                                                         | (3) Tidal Ma                        | rsh Channel Stability    | NA             |              |  |
|                                                                         | (3) Tidal Ma                        | rsh Stream Geomorphology | NA             |              |  |
|                                                                         | (1) Water Quality                   |                          | HIGH           |              |  |
|                                                                         | (2) Baseflow                        |                          | HIGH           |              |  |
|                                                                         | (2) Streamside Area Veg             | getation                 | MEDIUM         |              |  |
|                                                                         | (3) Upland Polluta                  | nt Filtration            | LOW            |              |  |
|                                                                         | (3) Thermoregulat                   | ion                      | HIGH           |              |  |
|                                                                         | (2) Indicators of Stresso           | rs                       | NO             |              |  |
|                                                                         | (2) Aquatic Life Tolerand           | .e                       | HIGH           |              |  |
|                                                                         | (2) Intertidal Zone Filtratio       | n                        | NA             |              |  |
|                                                                         | (1) Habitat                         |                          | HIGH           |              |  |
|                                                                         | (2) In-stream Habitat               |                          | HIGH           |              |  |
|                                                                         | (3) Baseflow                        |                          | HIGH           |              |  |
|                                                                         | (3) Substrate                       |                          | MEDIUM         |              |  |
|                                                                         | (3) Stream Stabilit                 | у —                      | HIGH           |              |  |
|                                                                         | (3) In-stream Habi                  | itat —                   | HIGH           |              |  |
|                                                                         | (2) Stream-side Habitat             |                          | HIGH           |              |  |
|                                                                         | (3) Stream-side H                   | abitat                   | MEDIUM         |              |  |
|                                                                         | (3) Thermoregulat                   | ion                      | HIGH           |              |  |
|                                                                         | (2) Tidal Marsh In-stream           | Habitat                  | NA             |              |  |
|                                                                         | (3) Flow Restriction                | ı —                      | NA             |              |  |
|                                                                         | (3) Tidal Marsh Stro                | eam Stability            | NA             |              |  |
|                                                                         | (4) Tidal Ma                        | rsh Channel Stability    | NA             |              |  |
|                                                                         | (4) Tidal Ma                        | rsh Stream Geomorphology | NA             |              |  |
|                                                                         | (3) Tidal Marsh In-s                | stream Habitat           | NA             |              |  |
|                                                                         | (2) Intertidal Zone                 |                          | NA             |              |  |
|                                                                         | Overall                             |                          | HIGH           |              |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #:                                                                                    | NCDWR #:                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |
|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| INSTRUCTIONS: Attach a sk                                                                       | <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                                                                                                                 |  |  |  |  |  |  |
| and circle the location of the s                                                                | stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and                                                                                                                                                            |  |  |  |  |  |  |
| number all reaches on the atta                                                                  | iched map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions                                                                                                                                                               |  |  |  |  |  |  |
| and explanations of requested                                                                   | I information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the                                                                                                                                                                 |  |  |  |  |  |  |
| NOTE EVIDENCE OF STRES                                                                          | SORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                                                                        |  |  |  |  |  |  |
| PROJECT/SITE INFORMATIO                                                                         | DN:<br>Henov Mill 2. Data of evaluation: 00/05/2010                                                                                                                                                                                                                       |  |  |  |  |  |  |
| 3 Applicant/owner name                                                                          | NCDMS 4 Assessor name/organization: K Suggs/ Wildlands Eng                                                                                                                                                                                                                |  |  |  |  |  |  |
| 5. County:                                                                                      | Surry 6 Nearest named water body                                                                                                                                                                                                                                          |  |  |  |  |  |  |
| 7. River basin:                                                                                 | Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                                                              |  |  |  |  |  |  |
| 8. Site coordinates (decimal de                                                                 | egrees, at lower end of assessment reach): 36.432451, -80.60716                                                                                                                                                                                                           |  |  |  |  |  |  |
| STREAM INFORMATION: (de<br>9. Site number (show on attac                                        | hed map): UT6 R2 10. Length of assessment reach evaluated (feet): 265                                                                                                                                                                                                     |  |  |  |  |  |  |
| 11. Channel depth from bed (in                                                                  | n riffle, if present) to top of bank (feet): 1 - 2'                                                                                                                                                                                                                       |  |  |  |  |  |  |
| 12. Channel width at top of ba                                                                  | nk (feet): 15' 13. Is assessment reach a swamp steam?  Yes  No                                                                                                                                                                                                            |  |  |  |  |  |  |
| 14. Feature type: ⊠Perennia                                                                     | I flow Intermittent flow Tidal Marsh Stream                                                                                                                                                                                                                               |  |  |  |  |  |  |
| STREAM CATEGORY INFOR                                                                           | RATION:                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| 15. NC SAM Zone:                                                                                | 🗌 Mountains (M) 🛛 Piedmont (P) 🗌 Inner Coastal Plain (I) 🗌 Outer Coastal Plain (O)                                                                                                                                                                                        |  |  |  |  |  |  |
|                                                                                                 |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
|                                                                                                 |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 16. Estimated geomorphic                                                                        |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| valley shape (skip for                                                                          | (more sinuous stream flatter valley slope) (loss sinuous stream steeper valley slope)                                                                                                                                                                                     |  |  |  |  |  |  |
|                                                                                                 |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 17. Watershed size: (SKIp                                                                       | $\boxtimes$ Size 1 (< 0.1 m <sup>2</sup> ) $\square$ Size 2 (0.1 to < 0.5 m <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5 m <sup>2</sup> ) $\square$ Size 4 (2.5 m <sup>2</sup> )                                                                                           |  |  |  |  |  |  |
|                                                                                                 | J.                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| 18. Were regulatory considera                                                                   | tions evaluated? XYes No If Yes, check all that apply to the assessment area.                                                                                                                                                                                             |  |  |  |  |  |  |
| Section 10 water                                                                                | Classified Trout Waters                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| Essential Fish Habitat                                                                          | Essential Fish Habitat Primary Nursery Area High Quality Waters/Outstanding Resource Waters                                                                                                                                                                               |  |  |  |  |  |  |
| Publicly owned property                                                                         | / UNCDWR Riparian buffer rule in effect UNutrient Sensitive Waters                                                                                                                                                                                                        |  |  |  |  |  |  |
|                                                                                                 | □JUAMA Area of Environmental Concern (AEC)                                                                                                                                                                                                                                |  |  |  |  |  |  |
| List species:                                                                                   | or a reactar and/or state instea protected species within the assessment area.                                                                                                                                                                                            |  |  |  |  |  |  |
| Designated Critical Hab                                                                         | itat (list species)                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
| 19. Are additional stream infor                                                                 | mation/supplementary measurements included in "Notes/Sketch" section or attached?  Yes  No                                                                                                                                                                                |  |  |  |  |  |  |
| 1. Channel Water – assessr                                                                      | ment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                                                                       |  |  |  |  |  |  |
| A Water throughout                                                                              | t assessment reach.                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
| B No flow, water in                                                                             | pools only.                                                                                                                                                                                                                                                               |  |  |  |  |  |  |
| C No water in asses                                                                             | ssment reach.                                                                                                                                                                                                                                                             |  |  |  |  |  |  |
| 2. Evidence of Flow Restric                                                                     | tion – assessment reach metric                                                                                                                                                                                                                                            |  |  |  |  |  |  |
| A At least 10% of a                                                                             | assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the                                                                                                                                                      |  |  |  |  |  |  |
| point of obstruction                                                                            | ng flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within<br>reach (avamples: undersized or perched sulverts, causeways that constrict the shapped, tidal gates, debris isme                        |  |  |  |  |  |  |
| beaver dams)                                                                                    | כמכוז (כהמוזוףוכה. מוזעכוהובים טו דבורובים כמוזיבונה, כמטהבישמעה נוומו נטווגנווכו נווב כוומוזופו, נוטמו gates, debris jams,                                                                                                                                               |  |  |  |  |  |  |
| ⊠B Not A                                                                                        |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 3. Feature Pattern – assess                                                                     | ment reach metric                                                                                                                                                                                                                                                         |  |  |  |  |  |  |
| $\square A$ A majority of the                                                                   | assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                                                                                                                                      |  |  |  |  |  |  |
| B Not A                                                                                         |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 4. Feature Longitudinal Pro                                                                     | file – assessment reach metric                                                                                                                                                                                                                                            |  |  |  |  |  |  |
| A Majority of asses                                                                             | sment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over                                                                                                                                                            |  |  |  |  |  |  |
| widening, active                                                                                | aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these                                                                                                                                                                |  |  |  |  |  |  |
| disturbances).                                                                                  |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
|                                                                                                 |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 5. Signs of Active Instability                                                                  |                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
|                                                                                                 | y – assessment reach metric                                                                                                                                                                                                                                               |  |  |  |  |  |  |
| Consider only current in                                                                        | y – assessment reach metric<br>stability, not past events from which the stream has currently recovered. Examples of instability include                                                                                                                                  |  |  |  |  |  |  |
| <b>Consider only current in</b><br>active bank failure, active of<br>$\Box A < 10\%$ of channel | y – assessment reach metric<br>stability, not past events from which the stream has currently recovered. Examples of instability include<br>channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).<br>I unstable |  |  |  |  |  |  |

 $\boxtimes C$  > 25% of channel unstable

# 6. Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).

| Consi | der for | the | Left | Bank | ( |
|-------|---------|-----|------|------|---|
| LB    | RB      |     |      |      |   |

- A Little or no evidence of conditions that adversely affect reference interaction
  - Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] <u>or</u> too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) <u>or</u> floodplain/intertidal zone unnaturally absent <u>or</u> assessment reach is a man-made feature on an interstream divide

#### 7. Water Quality Stressors – assessment reach/intertidal zone metric

#### Check all that apply.

□а ⊠в

ПС

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)
- B Excessive sedimentation (burying of stream features or intertidal zone)
- C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- D Odor (not including natural sulfide odors)
- E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.
- F Livestock with access to stream or intertidal zone
- G Excessive algae in stream or intertidal zone
- Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: \_\_\_\_\_ (explain in "Notes/Sketch" section)
- J Little to no stressors

#### 8. Recent Weather – watershed metric (skip for Tidal Marsh Streams)

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- A Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours
- B Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- C No drought conditions

#### 9. Large or Dangerous Stream – assessment reach metric

Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. 
Yes 
No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
   B Multiple sticks and/or leaf packs and/or emergent vegetation
   C Multiple snags and logs (including lap trees)
- D 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only | ⊣G H ⊢ J K |
|------------------------------------------|------------|
|------------------------------------------|------------|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- 11a. 
  Yes 
  No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)
- 11b. Bedform evaluated. Check the appropriate box(es).
  - A Riffle-run section (evaluate 11c)
  - B Pool-glide section (evaluate 11d)
  - C Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach.
  NP
  P
  C
  A
  P

| r MONAU |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus |
|---------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|
|         |  | Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus                                                                                               |

11d. Tyes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Xes No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - >1 Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.

| $\boxtimes$ | Adult frogs                 |
|-------------|-----------------------------|
| H           |                             |
| H           |                             |
| H           |                             |
|             | Beetles                     |
|             | Caddisfly larvae (T)        |
|             | Asian clam (Corbic          |
|             | Crustacean (isopod          |
|             | Damselfly and drag          |
| П           |                             |
| H           | $\square$ Mayfly larvae (E) |
| H           |                             |
| 님           |                             |
|             | Midges/mosquito la          |
|             | Mosquito fish (Gar          |
|             | Mussels/Clams (no           |
|             | Other fish                  |
| <b></b>     | Salamanders/tadpo           |
| Н           |                             |
| H           | Stonefly Jarvae (P)         |
| H           |                             |
|             |                             |
|             | Worms/leeches               |

1

- Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans
- Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
- Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea*)
- Mussels/Clams (not Corbicula)
- Other fish Salamanders/tadpoles
- Stonefly larvae (P)
- Tipulid larvae
- Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.

| ID | DD |                                                                                                                               |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
|    | RD |                                                                                                                               |
| ×Α | ×Α | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
| ⊟в | ⊟в | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach.

- LB ×Ν
- RB ×Ν Are wetlands present in the streamside area?
- ΠN ΠN
- 16. Baseflow Contributors assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

## Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΔD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ĒΕ Stream bed or bank soil reduced (dig through deposited sediment if present)
- □F None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

- Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA
- □в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)
- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- ΠE Assessment reach relocated to valley edge
- ⊠F None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- Degraded (example: scattered trees) ⊠В
- □С Stream shading is gone or largely absent

| 19. | Buffer Width – streamside area metric | (ski | p for | Tidal | Marsh | Streams) |
|-----|---------------------------------------|------|-------|-------|-------|----------|
|     |                                       | ·    |       |       |       |          |

Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.

|     | to the first break.<br>Vegetated Wooded                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | LBKBLBKB $\boxtimes A$ $\square A$ $\square A$ $\ge 100$ feet wide or extends to the edge of the watershed $\square B$ $\square B$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square C$ $\square C$ $\square D$ $\square E$ $\square E$ $\square E$ $\square E$ $\square E$ $\square E$ $\square D$ $\square E$ $\square E$ $\square E$ $\square E$ $\square E$ $\square E$ $\square D$ </th |
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)<br>Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).<br>LB RB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|     | Imature forest         Imatur                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 21. | Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)<br>Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is<br>within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).<br>If none of the following stressors occurs on either bank, check here and skip to Metric 22:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|     | Abuts < 30 feet 30-50 feet<br>LB RB LB RB LB RB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | A       A       A       A       Row crops         B       B       B       B       B       B       B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|     | C       C       C       C       Pasture (no livestock)/commercial horticulture         D       D       D       D       D       Pasture (active livestock use)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 22. | Stem Density – streamside area metric (skip for Tidal Marsh Streams)<br>Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>LB RB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|     | □A Medium to high stem density<br>⊠B ⊠B Low stem density<br>□C □C No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|     | LB RB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|     | $ \begin{array}{c c c c c c c c c c c c c c c c c c c $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)<br>Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to<br>assessment reach habitat.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|     | A A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|     | B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|     | <ul> <li>C IC IC Communities missing understory but retaining canopy trees.</li> <li>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 25. | Conductivity – assessment reach metric (skip for all Coastal Plain streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|     | 25a. ∐Yes ⊠No Was conductivity measurement recorded?<br>If No, select one of the following reasons. ☐No Water ☐Other:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|     | 25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br>$\square A < 46$ $\square B = 46$ to < 67 $\square C = 67$ to < 79 $\square D = 79$ to < 230 $\square E \ge 230$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name     | Honey Mill                           | Date of Assessment 09/05/2019 |                            |                       |  |
|----------------------|--------------------------------------|-------------------------------|----------------------------|-----------------------|--|
| Stream Category      | Pa1                                  | Assessor Name/Organization    | n K. Suggs/ Wildlands Eng. |                       |  |
|                      |                                      |                               |                            |                       |  |
| Notes of Field Asses | ssment Form (Y/N)                    |                               | NO                         |                       |  |
| Presence of regulate | ory considerations (Y/N)             |                               | YES                        |                       |  |
| Additional stream in | formation/supplementary measu        | rements included (Y/N)        | NO                         |                       |  |
| NC SAM feature typ   | e (perennial, intermittent, 1 idal N | larsh Stream)                 | Perenniai                  |                       |  |
|                      |                                      |                               |                            | NODWD                 |  |
|                      | Function Class Rating Summ           | harv                          | USACE/<br>All Streams      | NCDWR<br>Intermittent |  |
|                      | (1) Hydrology                        |                               | I OW                       | Internittent          |  |
|                      | (1) Hydrology<br>(2) Baseflow        | —                             | HIGH                       |                       |  |
|                      | (2) Flood Flow                       | —                             |                            |                       |  |
|                      | (2) Trood Trow<br>(3) Streamside Ar  | ea Attenuation                | MEDILIM                    |                       |  |
|                      | (0) Streamside Al                    |                               | MEDIUM                     |                       |  |
|                      | (4) Noodoo                           | Piparian Ruffor               |                            |                       |  |
|                      | (4) Wooded<br>(4) Microtor           |                               | HIGH                       |                       |  |
|                      | (3) Stroom Stabili                   |                               |                            |                       |  |
|                      | (3) Stream Stabili                   | y                             |                            |                       |  |
|                      | (4) Channe                           | Stability                     |                            |                       |  |
|                      | (4) Sedimer                          |                               |                            |                       |  |
|                      | (4) Stream/Intertio                  | Geomorphology                 |                            |                       |  |
|                      | (2) Stream/Intertio                  |                               |                            |                       |  |
|                      |                                      |                               |                            |                       |  |
|                      | (2) Tidal Marsh Str                  | eam Stability                 | NA                         |                       |  |
|                      |                                      |                               | NA                         |                       |  |
|                      | (3) Iidal Ma                         | rsh Stream Geomorphology      | NA                         |                       |  |
|                      | (1) Water Quality                    |                               | MEDIUM                     |                       |  |
|                      | (2) Baseflow                         |                               | HIGH                       |                       |  |
|                      | (2) Streamside Area Veg              | getation                      | LOW                        |                       |  |
|                      | (3) Upland Polluta                   |                               | LOW                        |                       |  |
|                      | (3) Thermoregulat                    | ion                           | MEDIUM                     |                       |  |
|                      | (2) Indicators of Stresso            | rs                            | YES                        |                       |  |
|                      | (2) Aquatic Life Tolerand            | e                             | HIGH                       |                       |  |
|                      | (2) Intertidal Zone Filtratio        | n                             | NA                         |                       |  |
|                      | (1) Habitat                          | _                             | LOW                        |                       |  |
|                      | (2) In-stream Habitat                | _                             | LOW                        |                       |  |
|                      | (3) Baseflow                         | _                             | HIGH                       |                       |  |
|                      | (3) Substrate                        | _                             | LOW                        |                       |  |
|                      | (3) Stream Stabilit                  | y                             | LOW                        |                       |  |
|                      | (3) In-stream Hab                    | itat                          | LOW                        |                       |  |
|                      | (2) Stream-side Habitat              |                               | LOW                        |                       |  |
|                      | (3) Stream-side H                    | abitat                        | LOW                        |                       |  |
|                      | (3) Thermoregulat                    | ion                           | MEDIUM                     |                       |  |
|                      | (2) Tidal Marsh In-stream            | Habitat                       | NA                         |                       |  |
|                      | (3) Flow Restriction                 | n                             | NA                         |                       |  |
|                      | (3) Tidal Marsh Str                  | eam Stability                 | NA                         |                       |  |
|                      | (4) Tidal Ma                         | rsh Channel Stability         | NA                         |                       |  |
|                      | (4) Tidal Ma                         | rsh Stream Geomorphology      | NA                         |                       |  |
|                      | (3) Tidal Marsh In-s                 | stream Habitat                | NA                         |                       |  |
|                      | (2) Intertidal Zone                  | —                             | NA                         |                       |  |
|                      | Overall                              |                               | LOW                        |                       |  |

# NC SAM FIELD ASSESSMENT RESULTS

| USACE AID #: NCDWR #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|
| <b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |
| and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
| number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |  |  |  |  |  |
| NC SAM User Manual for examples of additional measurements that may be relevant.<br>NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| PROJECT/SITE INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |
| 3 Applicant/owner name: NCDMS 4 Assessor name/organization: K Suggs/ Wildlands Eng                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |  |  |  |  |  |
| 5. County: Surry 6. Nearest named water body                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| 7. River basin: Yadkin on USGS 7.5-minute quad: Ararat River                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| 8. Site coordinates (decimal degrees, at lower end of assessment reach): 36.432563, -80.606856                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |
| STREAM INFORMATION: (depth and width can be approximations)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
| 11. Channel depth from bed (in riffle, if present) to top of bank (feet): 7'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| 12. Channel width at top of bank (feet): 15' 13 Is assessment reach a swamp steam? TYes TNo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
| 14. Feature type: Perennial flow Intermittent flow Tidal Marsh Stream                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |  |  |  |
| STREAM CATEGORY INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| 15. NC SAM Zone: Mountains (M) Piedmont (P) Inner Coastal Plain (I) Outer Coastal Plain (O)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| valley shape (skip for                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |
| <b>Tidal Marsh Stream</b> ): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| 17. Watershed size: (skip $\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5 mi <sup>2</sup> ) $\square$ Size 4 (≥ 5 mi <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |
| for Tidal Marsh Stream)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| ADDITIONAL INFORMATION:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| 18. Were regulatory considerations evaluated? XYes No If Yes, check all that apply to the assessment area.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |
| □Section 10 water □Classified Trout Waters □Water Supply Watershed (□I □II □II □II □V □V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
| Essential Fish Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |
| Publicly owned property INCDWR Riparian buffer rule in effect Nutrient Sensitive Waters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| Anadromous tish I303(d) List IcaAMA Area of Environmental Concern (AEC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |
| List species:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |  |  |  |
| Designated Critical Habitat (list species)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |  |  |  |  |  |
| 19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached? Ves. No                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| 1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| A Water throughout assessment reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |  |  |  |
| B No flow, water in pools only.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| C No water in assessment reach.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| 2. Evidence of Flow Restriction – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |
| At least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |
| point of obstructing flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb w                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris ja                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| $\square$ B Not A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| 3. Feature Pattern – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |
| A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| 4. Feature Longitudinal Profile – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |
| A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, existing damm |  |  |  |  |  |  |
| widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
| aisturbances).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |
| 5. Signs of Active Instability – assessment reach metric                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |  |  |  |  |  |
| Consider only current instability, not past events from which the stream has currently recovered. Examples of instability incl                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |  |  |  |
| active parts ratificial hardening (such as concrete, gabion, rip-rap). $\Box \Delta = < 10\%$ of channel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |  |  |  |  |  |
| $\square B$ 10 to 25% of channel unstable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |  |  |  |

 $\boxtimes C$  > 25% of channel unstable

#### Streamside Area Interaction – streamside area metric 6. eft Bank (LB) and the Right Bank (RB).

| Consider for the L |    |  |  |  |  |
|--------------------|----|--|--|--|--|
| LB                 | RB |  |  |  |  |
| ΠA                 | ΠA |  |  |  |  |
| ПВ                 | ПВ |  |  |  |  |

⊠C

- □A □B Little or no evidence of conditions that adversely affect reference interaction
- Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])
- ⊠C Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on an interstream divide

#### Water Quality Stressors - assessment reach/intertidal zone metric 7.

#### Check all that apply.

- Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ΠА
- ⊠в Excessive sedimentation (burying of stream features or intertidal zone)
- Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem
- Odor (not including natural sulfide odors) DD
- Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" ΠE section.
- □F Livestock with access to stream or intertidal zone
- ŪG Excessive algae in stream or intertidal zone
- □н Degraded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc)
- Other: (explain in "Notes/Sketch" section)
- □J Little to no stressors

#### Recent Weather - watershed metric (skip for Tidal Marsh Streams) 8.

- For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.
- Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ΠA
- ΠВ Drought conditions and rainfall exceeding 1 inch within the last 48 hours
- ⊠c No drought conditions

#### Large or Dangerous Stream – assessment reach metric 9.

Yes ⊠No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).

#### 10. Natural In-stream Habitat Types - assessment reach metric

10a. ⊠Yes □No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging) (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)

#### 10b. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)

- Multiple aguatic macrophytes and aguatic mosses ΠA (include liverworts, lichens, and algal mats)
- ⊠в Multiple sticks and/or leaf packs and/or emergent vegetation ⊠C Multiple snags and logs (including lap trees)
- ΠD 5% undercut banks and/or root mats and/or roots
- in banks extend to the normal wetted perimeter
- E Little or no habitat

| Check for Tidal<br>Marsh Streams<br>Only<br>A C I H D 1<br>A C I H D 1 |  |
|------------------------------------------------------------------------|--|
|------------------------------------------------------------------------|--|

5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat

#### 

### 11. Bedform and Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

- No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams) 11a. TYes
- 11b. Bedform evaluated. Check the appropriate box(es).
  - ⊠Α Riffle-run section (evaluate 11c)
  - Pool-glide section (evaluate 11d) □В
  - ПС Natural bedform absent (skip to Metric 12, Aquatic Life)
- 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach whether or not submerged. Check at least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare (R) = present but < 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages should not exceed 100% for each assessment reach. NP P C ۸ D

|  |  | Bedrock/saprolite<br>Boulder (256 – 4096 mm)<br>Cobble (64 – 256 mm)<br>Gravel (2 – 64 mm)<br>Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm) |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | Sand (.062 – 2 mm)<br>Silt/clay (< 0.062 mm)<br>Detritus<br>Artificial (rip-rap, concrete, etc.)                                           |

11d. Yes No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

#### 12. Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)

- 12a. ⊠Yes □No Was an in-stream aquatic life assessment performed as described in the User Manual? If No, select one of the following reasons and skip to Metric 13. No Water Other:
- 12b. Yes ⊠No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
  - Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. >1
  - Adult frogs

1

- Aquatic reptiles
  - Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
- Beetles
- Caddisfly larvae (T)
- Asian clam (Corbicula)
- Crustacean (isopod/amphipod/crayfish/shrimp)
- Dipterans Mayfly larvae (E)
- Megaloptera (alderfly, fishfly, dobsonfly larvae)
- Midges/mosquito larvae
  - Mosquito fish (*Gambusia*) or mud minnows (*Umbra pygmaea*)
- Mussels/Clams (not Corbicula)
  - Other fish Salamanders/tadpoles

  - Stonefly larvae (P)
  - Tipulid larvae
  - Worms/leeches

#### 13. Streamside Area Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)

Consider for the Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff. LB RB

| ΜA | ×Α | Little or no alteration to water storage capacity over a majority of the streamside area                                      |
|----|----|-------------------------------------------------------------------------------------------------------------------------------|
| □В | □В | Moderate alteration to water storage capacity over a majority of the streamside area                                          |
| □C | □C | Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, |
|    |    | livestock disturbance, buildings, man-made levees, drainage pipes)                                                            |

#### 14. Streamside Area Water Storage - streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Consider for the Left Bank (LB) and the Right Bank (RB) of the streamside area.

- LB RB ΠA ΠA ⊡в □в ⊠c
  - Majority of streamside area with depressions able to pond water  $\geq 6$  inches deep
  - Majority of streamside area with depressions able to pond water 3 to 6 inches deep
  - ⊠C Majority of streamside area with depressions able to pond water < 3 inches deep

#### 15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)

Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal wetted perimeter of assessment reach. RB

- LB ×Ν
  - ×Ν Are wetlands present in the streamside area?
- ΠN ΠN

#### 16. Baseflow Contributors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)

### Check all contributors within the assessment reach or within view of and draining to the assessment reach.

- ⊠Α Streams and/or springs (jurisdictional discharges)
- ⊡в Ponds (include wet detention basins; do not include sediment basins or dry detention basins)
- □с Obstruction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
- ΔD Evidence of bank seepage or sweating (iron in water indicates seepage)
- ĒΕ Stream bed or bank soil reduced (dig through deposited sediment if present)
- ΠF None of the above

## 17. Baseflow Detractors – assessment area metric (skip for Tidal Marsh Streams)

#### Check all that apply.

- Evidence of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ΠA
- □в Obstruction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) □с Urban stream ( $\geq$  24% impervious surface for watershed)
- Evidence that the streamside area has been modified resulting in accelerated drainage into the assessment reach DD
- ΠE Assessment reach relocated to valley edge
- ⊠F None of the above

#### 18. Shading – assessment reach metric (skip for Tidal Marsh Streams)

- Consider aspect. Consider "leaf-on" condition.
- ΠA Stream shading is appropriate for stream category (may include gaps associated with natural processes)
- ⊠В Degraded (example: scattered trees)
- □С Stream shading is gone or largely absent

Buffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out

|     | to the first break.VegetatedWoodedLBRBLB $\square A$ $\square A$ $\supseteq 100$ feet wide or extends to the edge of the watershed $\square A$ $\square A$ $\square A$ $\square B$ $\square B$ $\square B$ $\square C$ $\square C$ $\square C$ $\square D$ $\square D$ $\square D$ $\square D$ $\square D$ $\square B$ <t< th=""></t<> |  |  |  |  |  |  |  |  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|
| 20. | Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)         Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).         LB       RB         □A       □A         □B       □B         Non-mature woody vegetation or modified vegetation structure         □C       □C         □D       □D         □D       □D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |
| 21. | Buffer Stressors - streamside area metric (skip for Tidal Marsh Streams)         Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).         If none of the following stressors occurs on either bank, check here and skip to Metric 22:         Abuts       < 30 feet         30-50 feet         LB       RB         LB       RB         LB       RB         LB       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         B       B         C       C         C       C         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D         D       D                                                                                                                                                                                                                                                                                                                                                                                    |  |  |  |  |  |  |  |  |
| 22. | em Density – streamside area metric (skip for Tidal Marsh Streams)<br>onsider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).<br>RB<br>A □A Medium to high stem density<br>B □B Low stem density<br>C ⊠C No wooded riparian buffer or predominantly herbaceous species or bare ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |
| 23. | Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)         Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.         LB       RB         △A       △A       The total length of buffer breaks is < 25 percent.         □B       □B       The total length of buffer breaks is between 25 and 50 percent.         □C       □C       The total length of buffer breaks is > 50 percent.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |  |  |  |  |  |
| 24. | Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       □A         Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       □B         ∨egetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |  |  |  |  |  |
| 25. | <ul> <li>Communities with non-native invasive species present, but not dominant, over a large portion of the expected strata communities missing understory but retaining canopy trees.</li> <li>Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of plant stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.</li> <li>Conductivity – assessment reach metric (skip for all Coastal Plain streams)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |
|     | <ul> <li>25a. ∐Yes ⊠No Was conductivity measurement recorded?<br/>If No, select one of the following reasons. ☐No Water ☐Other:</li> <li>25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).<br/>☐A &lt; 46 ☐B 46 to &lt; 67 ☐C 67 to &lt; 79 ☐D 79 to &lt; 230 ☐E ≥ 230</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |  |  |  |  |  |

Notes/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

| Stream Site Name     | Honey Mill                          | Date of Assessmen          | t 09/05/2019          | 09/05/2019            |  |  |  |
|----------------------|-------------------------------------|----------------------------|-----------------------|-----------------------|--|--|--|
| Stream Category      | Pa1                                 | n K. Suggs/ Wildlands Eng. |                       |                       |  |  |  |
|                      |                                     |                            |                       |                       |  |  |  |
| Notes of Field Asses | ssment Form (Y/N)                   |                            | NO                    |                       |  |  |  |
| Presence of regulate | ory considerations (Y/N)            |                            | YES                   |                       |  |  |  |
| Additional stream in | formation/supplementary measu       | NO                         | <u></u>               |                       |  |  |  |
| NC SAM feature typ   | e (perennial, intermittent, Tidal I | Marsh Stream)              | Intermitter           |                       |  |  |  |
|                      |                                     |                            | 110405/               | NODWD                 |  |  |  |
|                      | Function Class Bating Sum           | mary                       | USACE/<br>All Streams | NCDWR<br>Intermittent |  |  |  |
|                      | (1) Hydrology                       | LOW                        |                       |                       |  |  |  |
|                      | (1) Hydrology<br>(2) Baseflow       | HIGH                       | HIGH                  |                       |  |  |  |
|                      | (2) Elood Elow                      |                            |                       |                       |  |  |  |
|                      | (2) Tiood Tiow                      |                            |                       |                       |  |  |  |
|                      | (3) Streamster Al                   |                            |                       |                       |  |  |  |
|                      | (4) Floodpla                        |                            |                       |                       |  |  |  |
|                      | (4) Woode                           |                            |                       |                       |  |  |  |
|                      |                                     | pography                   |                       |                       |  |  |  |
|                      | (3) Stream Stabili                  | Lotability                 |                       |                       |  |  |  |
|                      | (4) Channe                          |                            |                       |                       |  |  |  |
|                      | (4) Sedime                          | nt Transport               | LOW                   |                       |  |  |  |
|                      | (4) Stream                          | Geomorphology              | MEDIUM                | MEDIUM                |  |  |  |
|                      | (2) Stream/Intertio                 |                            | NA                    | NA                    |  |  |  |
|                      | (2) Longitudinal Tie                | dal Flow                   | NA                    | NA                    |  |  |  |
|                      | (2) Tidal Marsh Str                 | eam Stability              | NA                    | NA                    |  |  |  |
|                      | (3) Tidal Ma                        | rsh Channel Stability      | NA                    | NA                    |  |  |  |
|                      | (3) Tidal Ma                        | NA                         | NA                    |                       |  |  |  |
|                      | (1) Water Quality                   | _                          | LOW                   | LOW                   |  |  |  |
|                      | (2) Baseflow                        | _                          | HIGH                  | HIGH                  |  |  |  |
|                      | (2) Streamside Area Ve              | HIGH                       | HIGH                  |                       |  |  |  |
|                      | (3) Upland Polluta                  | ant Filtration             | HIGH                  | HIGH                  |  |  |  |
|                      | (3) Thermoregula                    | MEDIUM                     | MEDIUM                |                       |  |  |  |
|                      | (2) Indicators of Stresso           | ors                        | YES                   | YES                   |  |  |  |
|                      | (2) Aquatic Life Toleran            | ce                         | LOW                   | NA                    |  |  |  |
|                      | (2) Intertidal Zone Filtratio       | on                         | NA                    | NA                    |  |  |  |
|                      | (1) Habitat                         |                            | LOW                   | LOW                   |  |  |  |
|                      | (2) In-stream Habitat               |                            | LOW                   | MEDIUM                |  |  |  |
|                      | (3) Baseflow                        |                            | HIGH                  | HIGH                  |  |  |  |
|                      | (3) Substrate                       | _                          | LOW                   | LOW                   |  |  |  |
|                      | (3) Stream Stabili                  | ty                         | LOW                   | LOW                   |  |  |  |
|                      | (3) In-stream Hab                   |                            | MEDIUM                | HIGH                  |  |  |  |
|                      | (2) Stream-side Habitat             | —                          | LOW                   | LOW                   |  |  |  |
|                      | (3) Stream-side H                   | labitat                    | LOW                   | LOW                   |  |  |  |
|                      | (3) Thermoregula                    | tion                       | LOW                   | LOW                   |  |  |  |
|                      | (2) Tidal Marsh In-stream           | Habitat                    | NA                    | NA                    |  |  |  |
|                      | (3) Flow Restriction                | n —                        | NA                    | NA                    |  |  |  |
|                      | (3) Tidal Marsh Str                 | NA                         | NA                    |                       |  |  |  |
|                      | (4) Tidal Marsh Od                  | rsh Channel Stability      | NA                    | NA                    |  |  |  |
|                      | (4) Tidal Ma                        | ursh Stream Geomorphology  | NA                    | NA                    |  |  |  |
|                      | (3) Tidal Marsh In-                 | stream Habitat             | NA                    | NA                    |  |  |  |
|                      | (2) Intertidal Zone                 |                            | NA                    | NA                    |  |  |  |
|                      | Overall                             |                            | IOW                   |                       |  |  |  |

## **APPENDIX 4 – Supplementary Design Information**

|                                       |                                       |           |                          |           | Existing C               | Conditions G | eomorphic | Parameters |                |        |                |     |                |     |
|---------------------------------------|---------------------------------------|-----------|--------------------------|-----------|--------------------------|--------------|-----------|------------|----------------|--------|----------------|-----|----------------|-----|
| Parameter                             | Notation                              | Units     | Venable Creek<br>Reach 2 |           | Venable Creek<br>Reach 3 |              | UT1       |            | UT2<br>Reach 2 |        | UT3<br>Reach 2 |     | UT6<br>Reach 2 |     |
|                                       |                                       |           | min                      | max       | min                      | max          | min       | max        | min            | max    | min            | max | min            | max |
| stream type                           |                                       |           |                          | E4        | E/C4                     |              | E4        | 4b         | C              | 4b     | E4             | 4b  | A              | \4  |
| drainage area                         | DA                                    | sq mi     |                          | 0.81      | 0                        | .94          | 0.        | 52         | 0.07           |        | 0.             | 03  | 0.             | .02 |
| bankfull cross-<br>sectional area     | A <sub>bkf</sub>                      | SF        | 15.6                     |           | 16.9                     | 18.1         | 9.8       |            | 1.2            |        | 3.8            |     | 1.6            |     |
| avg velocity during<br>bankfull event | V <sub>bkf</sub>                      | fps       | 4.8                      |           | 4.9                      |              | 5.3       |            | 8.1            |        | 1.6            |     | 2.5            |     |
| width at bankfull                     | W <sub>bkf</sub>                      | feet      | 10.6                     |           | 10.5                     | 10.8         | 8.7       |            | 4.0            |        | 4.2            |     | 2.1            |     |
| maximum depth at<br>bankfull          | d <sub>max</sub>                      | feet      | 2.0                      |           | 2.2                      | 2.3          | 1.6       |            | 0.4            |        | 1.1            |     | 1.1            |     |
| mean depth at<br>bankfull             | an depth at d <sub>bkf</sub> feet 1.5 |           | 1.5                      | 1.6       | 1.7                      | 1.1          |           | 0.3        |                | 0.9    |                | 0.8 |                |     |
| bankfull width to<br>depth ratio      |                                       |           |                          | 7.2       | 6.1                      | 6.9          | 7         | .6         | 1              | 2.7    | 4              | .7  | 2              | 7   |
| low bank height                       |                                       | feet      |                          | 3.2       | 2.8                      | 3.7          | 2.4       |            | C              | ).4    | 1.6            |     | 2.9            |     |
| bank height ratio                     | BHR                                   |           |                          | 1.6       | 1.3                      | 1.6          | 1.4       |            | 1.0            |        | 1              | .5  | 2.6            |     |
| floodprone area<br>width              | rone area w <sub>fpa</sub> feet 45.7  |           | 45.7                     | 93.4      | 110.5                    | 68.4         |           | 10.5       |                | 27.1   |                | 7.6 |                |     |
| entrenchment ratio                    | ER                                    |           | 4.3                      |           | 8.6                      | 10.5         | 7.9       |            | 2.7            |        | 6.4            |     | 3.7            |     |
| max pool depth at<br>bankfull         | d <sub>pool</sub>                     | feet      | 2.4                      |           | 2.2                      |              | 2.2       |            | 0.6            |        | 1.1            |     | 1.6            |     |
| pool depth ratio                      | d <sub>pool</sub> /d <sub>bkf</sub>   |           | 1.7                      |           | 1.4                      |              | 1.9       |            | 2.0            |        | 1.3            |     | 2.0            |     |
| pool width at<br>bankfull             | W <sub>pool</sub>                     | feet      |                          | 10.8      | 10.2                     |              | 8.4       |            | 6.4            |        | 4.2            |     | 2.3            |     |
| pool width ratio                      | w <sub>pool</sub> /w <sub>bkf</sub>   |           |                          | 1.0       | :                        | 1.0          | 1.0       |            | 1.6            |        | 1.0            |     | 1.1            |     |
| Bkf pool cross-<br>sectional area     | A <sub>pool</sub>                     | SF        |                          | 20.3 18.0 |                          | 11.5 2.5     |           | 2.5        | 3              | .3     | 2              | 5   |                |     |
| pool area ratio                       | A <sub>pool</sub> /A <sub>bkf</sub>   |           |                          | 1.3       | 1.1                      |              | 1.2       |            | 2.0            |        | 0.9            |     | 1.5            |     |
| pool-pool spacing                     | р-р                                   | feet      | 34                       | 61        | 21                       | 52           | 21        | 33         | 8              | 46     | 20             | 22  | 7              | 18  |
| pool-pool spacing<br>ratio            | p-p/W <sub>bkf</sub>                  |           | 3.2                      | 5.7       | 1.9                      | 4.9          | 2.5       | 3.9        | 2.0            | 11.6   | 4.7            | 5.3 | 3.3            | 8.7 |
| valley slope                          | S <sub>valley</sub>                   | feet/foot | 0                        | .0213     | 0.0                      | 0.0198       |           | 0.0284     |                | 0.0430 |                | 376 | 0.0822         |     |
| channel slope                         | S <sub>channel</sub>                  | feet/foot | 0                        | .0190     | 0.0136                   |              | 0.0212    |            | 0.0352         |        | 0.0369         |     | 0.0870         |     |
| sinuosity                             | К                                     |           |                          | 1.08      | 1                        | .14          | 1.        | 04         | 1.             | .18    | 1.             | 47  | 1.             | .01 |
| belt width                            | w <sub>blt</sub>                      | feet      |                          | 14.0      | 16.5                     | 27.0         |           |            | 11.9           | 12.5   | 23             | 3.3 |                |     |
| meander width<br>ratio                | w <sub>blt</sub> /w <sub>bkf</sub>    |           |                          | 1.3       | 1.5                      | 1.5 2.5      |           |            |                | 3.2    | 5.5            |     |                |     |
| meander length                        | L <sub>m</sub>                        | feet      | N/A                      |           | 22.8                     |              |           |            | 22.8           |        | N/A            |     |                |     |
| meander length<br>ratio               | L <sub>m</sub> /w <sub>bkf</sub>      |           |                          | N/A       | 2.1                      |              |           |            | 5.8            |        | N/A            |     |                |     |
| linear wavelength                     | LW                                    |           |                          | N/A       | 19.1                     |              | N/A       |            | 13.9           |        | N/A            |     | N/A            |     |
| linear wavelength<br>ratio            | LW/w <sub>bkf</sub>                   |           |                          | N/A       | 1.8                      |              |           |            | 3.5            |        | N/A            |     |                |     |
| radius of curvature                   | R <sub>c</sub>                        | feet      |                          | 7.0       | 5.7                      | 9.7          |           |            | 4.3            | 6.3    | 2              | .7  |                |     |
| radius of curvature<br>ratio          | R <sub>c</sub> / w <sub>bkf</sub>     |           |                          | 0.7       | 0.5                      | 0.9          |           | -          | 1.1            | 1.6    | 0              | .6  |                |     |
| d50 reachwide                         | d50                                   | mm        |                          | 40.6      | 1                        | 3.3          | 9         | .5         | 24             | 4.1    | 3              | .1  | 8              | 5.5 |

N/A - Channelized stream channel with limited pattern and bed form profile variability.

Appendix 4



#### Cross Section 1, Venable Creek Reach 2



View Downstream





## Cross Section 2, Venable Creek Reach 2



Field Crew: Wildlands Engineering

View Downstream





Field Crew: Wildlands Engineering

View Downstream



#### Cross Section 4, Venable Creek Reach 3



1.6 low bank height ratio

Survey Date: 6/2019 Field Crew: Wildlands Engineering

View Downstream




## Cross Section 5, Venable Creek Reach 3



Survey Date: 6/2019 Field Crew: Wildlands Engineering

View Downstream















11.5 x-section area (ft.sq.)

- 8.4 width (ft)
- 1.4 mean depth (ft)
- 2.2 max depth (ft)
- 10.1 wetted parimeter (ft)
- 1.1 hyd radi (ft)
- 6.1 width-depth ratio

Survey Date: 6/2019 Field Crew: Wildlands Engineering





- 9.4 wetted parimeter (ft)
- 1.0 hyd radi (ft)
- 7.6 width-depth ratio
- 68.4 W flood prone area (ft)
- 7.9 entrenchment ratio
- 1.4 low bank height ratio

Survey Date: 6/2019 Field Crew: Wildlands Engineering











Survey Date: 6/2019 Field Crew: Wildlands Engineering

View Downstream





# Cross Section 9, UT2 Reach 2



Survey Date: 6/2019 Field Crew: Wildlands Engineering







#### Cross Section 10, UT3 Reach 2



Survey Date: 6/2019 Field Crew: Wildlands Engineering





# Cross Section 11, UT3 Reach 2



Field Crew: Wildlands Engineering







## Cross Section 12, UT6 Reach 1



Survey Date: 6/2019 Field Crew: Wildlands Engineering





# Cross Section 13, UT6 Reach 2



Survey Date: 6/2019 Field Crew: Wildlands Engineering



#### Cross Section 14, UT6 Reach 2



Survey Date: 6/2019 Field Crew: Wildlands Engineering







| Reference Reach Geomorphic Parameters |                                        |                            |          |             |                     |                  |                    |                      |              |             |         |          |            |                   |               |           |        |                  |      |          |      |   |  |  |  |    |      |  |
|---------------------------------------|----------------------------------------|----------------------------|----------|-------------|---------------------|------------------|--------------------|----------------------|--------------|-------------|---------|----------|------------|-------------------|---------------|-----------|--------|------------------|------|----------|------|---|--|--|--|----|------|--|
|                                       | Notation                               | Units                      | Ironwood | l Tributary | Timber <sup>-</sup> | <b>Fributary</b> | UT to So<br>Fishin | outh Fork<br>g Creek | UT to Ga     | ap Branch   | Riverbe | end Park | Agony Acro | es UT1 Reach<br>3 | UT to Ro      | sky Creek | Box (  | Creel            |      |          |      |   |  |  |  |    |      |  |
|                                       |                                        |                            | min      | max         | min                 | max              | min                | max                  | min          | max         | min     | max      | min        | max               | min           | max       | min    |                  |      |          |      |   |  |  |  |    |      |  |
| stream type                           |                                        |                            | AS       | ba+         | E                   | 34               | В                  | 5a                   | Sightly Entr | renched B4a | (       | 24       |            | B4                |               | E4b       |        | 24               |      |          |      |   |  |  |  |    |      |  |
| drainage area                         | DA                                     | sa mi                      | 0        | 03          | 0                   | 04               | 0                  | 02                   | 0            | 04          | 0       | 26       | 0          | 15                | 1             | 05        | 2.1    |                  |      |          |      |   |  |  |  |    |      |  |
| design discharge                      | 0                                      | cfs                        | 1        | 3           | 1                   | 7                | 8                  |                      | 18.7         |             | 33      |          | 37         |                   | 85            |           | 9      | . <u>.</u><br>95 |      |          |      |   |  |  |  |    |      |  |
| hankfull cross sectional area         |                                        | CJ3                        | 27       |             |                     |                  | 1.0                |                      | 2.9          |             | 9.5     |          | 7.4        |                   | 16.2          |           | 28.0   |                  |      |          |      |   |  |  |  |    |      |  |
| average velocity during               | Abkf                                   | Sr                         | 2.7      |             | 4.0                 |                  | 1.0                |                      | 5.0          |             | 5.5     |          | /.+        |                   |               |           | 20     | 5.5              |      |          |      |   |  |  |  |    |      |  |
| bankfull event                        | v <sub>bkf</sub>                       | fps                        | 4        | .9          | 3                   | .7               | 4                  | .1                   | 5            | 5.0         | 3       | .5       |            | 4.9               | 5             | 5.5       |        | .3               |      |          |      |   |  |  |  |    |      |  |
|                                       |                                        | <b>_ _ _ _ _ _ _ _ _ _</b> |          | -           |                     | Cross-Sec        | tion               |                      |              |             |         |          | 1          |                   |               |           |        |                  |      |          |      |   |  |  |  |    |      |  |
| width at bankfull                     | W <sub>bkf</sub>                       | feet                       |          | 5           | 8                   | .9               | 4                  | .1                   | E            | 5.2         | 1       | J.6      | 1          | 1.1               | 12.2          |           | 23     | 3.5              |      |          |      |   |  |  |  |    |      |  |
| maximum depth at bankfull             | d <sub>max</sub>                       | feet                       | 0        | .8          | 0.7                 |                  | C                  | 0.7                  |              | 1           |         | 1.1      |            | 1                 |               | .8        | 1.     | 92               |      |          |      |   |  |  |  |    |      |  |
| mean depth at bankfull                | d <sub>bkf</sub>                       | feet                       | 0        | .6          | 0.                  | 50               | C                  | ).4                  | 0            | ).6         | (       | .9       |            | 0.7               | 1             | .3        | 1.     | 23               |      |          |      |   |  |  |  |    |      |  |
| bankfull width to depth               | w <sub>bkf</sub> /d <sub>bkf</sub>     |                            | 9        | .1          | 1                   | 7                | g                  | .3                   | 1            | 0.1         | 1       | 1.8      | 1          | 16.6              |               | 9.1       |        | Э.1              |      |          |      |   |  |  |  |    |      |  |
| ratio                                 | d (d                                   | faat                       | 0        | 2           | 1                   | 4                | 1                  | 0                    | 1            | 7           | 1       | 2        |            | 1                 | 1.2           |           | 1      | 7                |      |          |      |   |  |  |  |    |      |  |
| hank height ratio                     | BHR                                    | Jeel                       | 1        | .2          | 1                   | .4               |                    | o<br>1               |              | 1           | 1       |          |            | 1                 | 1.3           |           | 1./    |                  |      |          |      |   |  |  |  |    |      |  |
| floodprone area width                 | Wfee                                   | feet                       | 10       | ).3         | 1                   | 3.6              |                    | 7                    | 2            | 0.9         | 1       | 7.4      |            | 25                |               | 25 72     |        | 2                | 76.3 |          |      |   |  |  |  |    |      |  |
| entrenchment ratio                    | FR                                     | jeet                       | 2        | .1          | 1                   | .5               | 1                  | .7                   | 3            | 3.4         | 1       |          |            | 23                |               | 6         |        | .3               |      |          |      |   |  |  |  |    |      |  |
|                                       |                                        |                            |          |             |                     | Slope            |                    |                      |              |             |         |          |            |                   |               |           | _      |                  |      |          |      |   |  |  |  |    |      |  |
| valley slope                          | Svallev                                | feet/ foot                 | 0.1      | 135         | 0.0                 | 406              | 0.1                | .025                 | · ·          |             |         |          | C          | .05               | 0.03          |           | 0.023  |                  |      |          |      |   |  |  |  |    |      |  |
| channel slope                         | S <sub>chnl</sub>                      | feet/foot                  | 0.1      | 139         | 0.0                 | 334              | 0.0                | 815                  | 0.           | 068         | 0.      | .013     |            | 0.049             |               | 0.049     |        | 0.02 0.00        |      | 308      |      |   |  |  |  |    |      |  |
|                                       | •                                      |                            |          |             |                     | Profile          | e                  |                      |              |             |         |          |            |                   |               | -         |        |                  |      |          |      |   |  |  |  |    |      |  |
| riffle slope                          | S <sub>riffle</sub>                    | feet/foot                  | 0.034    | 0.28        | 0.02                | 0.15             | 0.024              | 0.2                  | 0.01         | 0.14        | 0.013   | 0.044    |            |                   | 0.1           | 0.1       | 0.010  |                  |      |          |      |   |  |  |  |    |      |  |
| riffle slope ratio                    | S <sub>riffle</sub> /S <sub>chnl</sub> |                            | 0.30     | 2.46        | 0.69                | 4.49             | 0.29               | 2.45                 | 0.16         | 2.06        | 1       | 3.4      |            |                   | 2.6           | 3.8       | 1.2    |                  |      |          |      |   |  |  |  |    |      |  |
| pool slope                            | Sp                                     | feet/ foot                 | 0        | 0.21        | 0                   | 0.082            | 0                  | 0.17                 | 0.00         | 0.06        | 0       | 0.005    |            |                   | 0             | 0.004     | 0.0000 | 0                |      |          |      |   |  |  |  |    |      |  |
| pool slope ratio                      | S <sub>p</sub> /S <sub>chnl</sub>      |                            | 0        | 1.84        | 0                   | 2.46             | 0                  | 2.09                 | 0.06         | 0.90        | 0       | 0.4      |            |                   | 0             | 0.2       | 0.00   |                  |      |          |      |   |  |  |  |    |      |  |
| pool-to-pool spacing                  | L <sub>p-p</sub>                       | feet                       | 3.1      | 30.6        | 6                   | 49.40            | 6.3                | 32                   | 18.4         | 26.8        | 9       | 70       |            |                   | 26.3          | 81.3      | 28.8   |                  |      |          |      |   |  |  |  |    |      |  |
| pool spacing ratio                    | L <sub>p-p</sub> /w <sub>bkf</sub>     |                            | 0.6      | 6.1         | 0.70                | 5.60             | 1.5                | 7.8                  | 2.99         | 4.35        | 0.8     | 6.4      |            |                   | 2.2           | 6.7       | 1.2    |                  |      |          |      |   |  |  |  |    |      |  |
| pool cross-sectional area             | A <sub>pool</sub>                      | SF                         | -        |             | -                   |                  | -                  |                      | 7            | .10         | 1       | 4.7      |            | 9.8               | 19            | 19.3      |        | €.9              |      |          |      |   |  |  |  |    |      |  |
| pool area ratio                       | A <sub>pool</sub> /A <sub>bkf</sub>    |                            | -        |             | -                   |                  | -                  |                      | 1            | .89         | 1       | 5        |            | 1.3               | 1             | .2        | 1.     | 73               |      |          |      |   |  |  |  |    |      |  |
| maximum pool depth                    | d <sub>pool</sub>                      | feet                       | -        |             | -                   |                  |                    |                      | 1            | .55         | 2       | 3        |            | 1.6               | 2             | .2        | 4.     | 39               |      |          |      |   |  |  |  |    |      |  |
| pool depth ratio                      | d <sub>pool</sub> /d <sub>bkf</sub>    |                            | -        |             | -                   |                  | -                  |                      | 2            | .54         | 2       | 6        |            | 2.3               | 1             | .6        | 3      | .6               |      |          |      |   |  |  |  |    |      |  |
| pool width at bankfull                | w <sub>pool</sub>                      | feet                       | -        |             | -                   |                  |                    |                      | 6            | .10         | ç       | .7       |            | 8.5               | 10.9          |           | 18     | 3.8              |      |          |      |   |  |  |  |    |      |  |
| pool width ratio                      | w <sub>pool</sub> /w <sub>bkf</sub>    |                            | -        |             | -                   |                  | -                  |                      | 0            | .99         | (       | .9       | 0.8        |                   | 0.9           |           | 0.8    |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | I.                                     | T                          | 1        | 10          | 1                   | Patter           | n                  |                      | T            |             | T       |          |            | 04                |               |           |        | 22               |      |          |      |   |  |  |  |    |      |  |
| sinuosity                             | K                                      | faat                       | 1.       | 19          | 1.                  | 12               | -                  |                      |              |             | -       | 1.04     |            | 04                | 1.1<br>N/A    |           | 1.     | 33               |      |          |      |   |  |  |  |    |      |  |
| Deit width                            | w <sub>blt</sub>                       | reet                       | -        |             | -                   |                  |                    |                      |              |             |         |          |            |                   |               |           |        |                  | IN,  | /A<br>/A | 62.0 |   |  |  |  |    |      |  |
| linear wavelength (formarly           | w <sub>blt</sub> /w <sub>bkf</sub>     |                            | -        |             | -                   |                  | -                  |                      | -            |             |         |          |            |                   |               |           | IN,    |                  | 2.0  |          |      |   |  |  |  |    |      |  |
| meander length)                       | L <sub>m</sub>                         | feet                       | -        |             | -                   |                  |                    |                      |              |             |         |          |            |                   | N,            | /A        | 38.8   |                  |      |          |      |   |  |  |  |    |      |  |
| linear wavelength ratio               | 1 64                                   |                            |          |             |                     |                  |                    |                      |              |             |         |          |            |                   |               |           |        | +                |      |          |      | 1 |  |  |  | /^ | 1 70 |  |
| (formeny meander length               | ∟ <sub>m</sub> /w <sub>bkf</sub>       |                            | -        |             | -                   |                  |                    |                      |              |             |         |          |            |                   | IN,           | A         | 1.70   |                  |      |          |      |   |  |  |  |    |      |  |
| meander length                        |                                        | feet                       | -        |             | -                   |                  | · .                |                      | · ·          |             |         |          |            |                   |               |           | 23.00  |                  |      |          |      |   |  |  |  |    |      |  |
| meander length ratio                  |                                        |                            | -        |             | -                   |                  | -                  |                      | -            |             | -       |          |            |                   |               |           | 1.0    | 1                |      |          |      |   |  |  |  |    |      |  |
| radius of curvature                   | R <sub>c</sub>                         | feet                       | -        |             | -                   |                  |                    |                      |              |             |         |          |            |                   | N             | /A        |        |                  |      |          |      |   |  |  |  |    |      |  |
| radius of curvature ratio             | R <sub>c</sub> / w <sub>bkf</sub>      |                            | -        |             | -                   |                  | -                  |                      | -            |             |         |          |            |                   | N             | /A        |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       |                                        | •                          | •        | Partic      | le Size Distril     | oution from      | Reach-wide         | Pebble Cou           | nt           |             |         |          | •          |                   |               |           |        |                  |      |          |      |   |  |  |  |    |      |  |
| d50 Des                               | cription                               |                            | Coars    | e Sand      | Mediur              | n Gravel         |                    |                      |              |             |         |          |            |                   | Coarse Gravel |           |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>16</sub>                        | mm                         | 0.       | 0.26        |                     | 49               | 0.09               |                      | 0.97         |             |         |          | 2          |                   | <0.063        |           |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>35</sub>                        | mm                         | 0        | .5          | 3                   | .5               | 0                  | .44                  |              | 8           |         |          |            | 12.9              |               | .4        |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>50</sub>                        | mm                         | 0.       | 91          | 6                   | .5               | 3                  | .60                  | 19           | 9.02        | · ·     |          | 5          | 0.6               | 22            | 2.6       |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>84</sub>                        | mm                         | 1        | 19          | 4                   | 18               | 2                  | 2.6                  | 10           | )2.3        | · ·     |          | 1          | 68.1              | 12            | 20        |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>95</sub>                        | mm                         | g        | 97          | 8                   | 33               | 28                 | 96.3                 | 2            | 56          | -       |          | 2          | 048               | 2             | 56        |        |                  |      |          |      |   |  |  |  |    |      |  |
|                                       | d <sub>100</sub>                       | mm                         | 1        | 28          | 1                   | 28               | >2                 | 048                  | >2           | 048         | -       |          | >2         | 2048              |               |           |        |                  |      |          |      |   |  |  |  |    |      |  |



|                                           |                                                        |            |                              |            |       |                              | Pro       | posed (   | Geomorph                     | nic Param  | neters |                              |                |            |                              |            |        |                              |        |        |
|-------------------------------------------|--------------------------------------------------------|------------|------------------------------|------------|-------|------------------------------|-----------|-----------|------------------------------|------------|--------|------------------------------|----------------|------------|------------------------------|------------|--------|------------------------------|--------|--------|
|                                           | Notation Unit                                          |            | Venable Creek<br>Reach 2     |            |       | Venable Creek<br>Reach 3     |           |           | UT1                          |            |        |                              | UT2<br>Reach 2 |            | UT3<br>Reach 2               |            |        | UT6<br>Reach 2               |        |        |
|                                           |                                                        | Units      | Typical<br>Section<br>Values | Min        | Max   | Typical<br>Section<br>Values | Min       | Max       | Typical<br>Section<br>Values | Min        | Max    | Typical<br>Section<br>Values | Min            | Max        | Typical<br>Section<br>Values | Min        | Max    | Typical<br>Section<br>Values | Min    | Max    |
| stream type                               |                                                        |            |                              | B4         |       |                              | C4        |           |                              | C4b        |        |                              | B4             |            |                              | B4         |        |                              | A4     |        |
| drainage area                             | DA                                                     | sq mi      |                              | 0.81       |       |                              | 0.94      |           |                              | 0.52       |        |                              | 0.07           |            |                              | 0.03       |        |                              | 0.02   |        |
| design discharge                          | Q                                                      | cfs        |                              | 75         |       | 83                           |           | 52        |                              |            |        | 10                           |                |            | 6                            |            | 4      |                              |        |        |
| bankfull cross-<br>sectional area         | A <sub>bkf</sub>                                       | SF         | 16.35                        |            | 17.31 |                              | 11.1      |           |                              | 2.59       |        |                              | 1.945          |            | 1.225                        |            |        |                              |        |        |
| average velocity<br>during bankfull event | V <sub>bkf</sub>                                       | fps        |                              | 4.6        |       |                              | 4.8       |           |                              | 4.7        |        |                              | 3.9            |            |                              | 3.1        |        |                              | 3.3    |        |
|                                           |                                                        |            |                              |            |       |                              |           |           | Cross-Sect                   | tion       |        |                              |                |            |                              |            |        |                              |        |        |
| width at bankfull                         | W <sub>bkf</sub>                                       | feet       |                              | 15.0       |       |                              | 15.6      |           |                              | 11.5       |        |                              | 5.6            |            |                              | 4.9        |        | <u> </u>                     | 3.7    | r      |
| maximum depth at                          | d <sub>max</sub>                                       | feet       | 1.7                          | 1.3        | 1.7   | 1.7                          | 1.4       | 1.7       | 1.5                          | 1.1        | 1.5    | 0.7                          | 0.6            | 0.7        | 0.6                          | 0.5        | 0.6    | 0.5                          | 0.4    | 0.5    |
| mean depth at<br>bankfull                 | d <sub>bkf</sub>                                       | feet       |                              | 1.09       |       |                              | 1.11      |           |                              | 0.97       |        |                              | 0.46           |            |                              | 0.40       |        |                              | 0.33   |        |
| bankfull width to<br>depth ratio          | $w_{bkf}/d_{bkf}$                                      |            |                              | 13.8       |       |                              | 14.1      |           |                              | 11.9       |        |                              | 12.1           |            | 12.3                         |            | 11.2   |                              |        |        |
| max depth ratio                           | $d_{max}/d_{bkf}$                                      | feet       |                              | 1.6        | 1     |                              | 1.5       | 1         |                              | 1.5        | 1      |                              | 1.5            | 1          |                              | 1.5        | 1      |                              | 1.5    |        |
| bank height ratio                         | BHR                                                    |            | 1.0                          | 1.0        | 1.2   | 1.0                          | 1.0       | 1.2       | 1.0                          | 1.0        | 1.2    | 1.0                          | 1.0            | 1.2        | 1.0                          | 1.0        | 1.2    | 1.0                          | 1.0    | 1.2    |
| width                                     | W <sub>fpa</sub>                                       | feet       | 30                           | 21         | 33    | 34                           | 34        | 156       | 25                           | 25         | 115    | 11                           | 8              | 12         | 11                           | 11         | 49     | 5                            | 4      | 5      |
| entrenchment ratio                        | ER                                                     |            | 2.0                          | 1.4        | 2.2   | 2.2                          | 2.2       | 10+       | 2.2<br>Slope                 | 2.2        | 10+    | 2.0                          | 1.4            | 2.2        | 2.2                          | 2.2        | 10+    | 1.4                          | 1.0    | 1.4    |
| valley slope                              | Svalley                                                | feet/ foot |                              | 0.0213     |       |                              | 0.0198    |           |                              | 0.0284     |        |                              | 0.0430         |            |                              | 0.0376     |        | (                            | 0.0822 |        |
| channel slope                             | S <sub>chnl</sub>                                      | feet/foot  |                              | 0.0210     |       | 0.0140                       | 0.0070    | 0.0210    | Profile                      | 0.0210     |        | 0.0380                       | 0.0320         | 0.0440     | 0.0340                       | 0.0260     | 0.0420 | 0.0822                       | 0.0820 | 0.1050 |
| riffle slope                              | S <sub>riffle</sub>                                    | feet/ foot | 1                            | 0.025      | 0.03  |                              | 0.012     | 0.035     |                              | 0.0240     | 0.0300 |                              | 0.036          | 0.050      |                              | 0.039      | 0.047  |                              | 0.094  | 0.124  |
| riffle slope ratio                        | S <sub>riffle</sub> /S <sub>chnl</sub>                 |            |                              | 1.2        | 1.5   |                              | 1.7       | 1.7       |                              | 1.1        | 1.4    |                              | 0.9            | 1.3        |                              | 1.1        | 1.4    |                              | 1.1    | 1.2    |
| pool slope                                | Sp                                                     | feet/foot  | 0.0                          | 0.0        | 0.0   | 0.0                          | 0.0       | 0.0       | 0.0                          | 0.0        | 0.0    | 0.0                          | 0.0            | 0.0        | 0.0                          | 0.0        | 0.0    | 0.0                          | 0.0    | 0.0    |
| pool slope ratio                          | S <sub>p</sub> /S <sub>chnl</sub>                      |            | 0.0                          | 0.0        | 0.0   | 0.0                          | 0.0       | 0.0       | 0.0                          | 0.0        | 0.0    | 0.0                          | 0.0            | 0.0        | 0.0                          | 0.0        | 0.0    | 0.0                          | 0.0    | 0.0    |
| pool-to-pool spacing                      | L <sub>p-p</sub>                                       | feet       | N/A                          | 40         | 57    | N/A                          | 68        | 116       | N/A                          | 34         | 52     | N/A                          | 9              | 44         | N/A                          | 10         | 42     | N/A                          | 8      | 18     |
| pool spacing ratio                        | $L_{p-p}/W_{bkf}$                                      |            | N/A                          | 2.7        | 3.8   | N/A                          | 4.4       | 7.4       | N/A                          | 3.0        | 4.5    | N/A                          | 1.6            | 7.9        | N/A                          | 2.0        | 8.6    | N/A                          | 2.2    | 4.9    |
| area                                      | A <sub>pool</sub>                                      | SF         | 30.2                         | 19.6       | 40.9  | 32.0                         | 20.8      | 43.3      | 20.5                         | 13.3       | 27.8   | 4.8                          | 3.1            | 6.5        | 3.6                          | 2.3        | 4.9    | 2.3                          | 1.5    | 3.1    |
| pool area ratio                           | A <sub>pool</sub> /A <sub>bkf</sub>                    |            | 1.85                         | 1.2        | 2.5   | 1.85                         | 1.2       | 2.5       | 1.85                         | 1.2        | 2.5    | 1.85                         | 1.2            | 2.5        | 1.85                         | 1.2        | 2.5    | 1.85                         | 1.2    | 2.5    |
| maximum pool depth                        | d <sub>pool</sub>                                      | feet       | 3.0                          | 1.6        | 4.4   | 3.1                          | 1.7       | 4.4       | 2.2                          | 1.4        | 2.9    | 1.0                          | 0.7            | 1.4        | 0.9                          | 0.6        | 1.2    | 0.7                          | 0.5    | 1.0    |
| pool depth ratio                          | d <sub>pool</sub> /d <sub>bkf</sub>                    |            | 2.75                         | 1.5        | 4.0   | 2.75                         | 1.5       | 4.0       | 2.25                         | 1.5        | 3.0    | 2.25                         | 1.5            | 3.0        | 2.25                         | 1.5        | 3.0    | 2.25                         | 1.5    | 3.0    |
| pool width at bankfull                    | w <sub>pool</sub>                                      | feet       |                              | 19.5       |       |                              | 20.2      |           |                              | 15.0       |        |                              | 7.5            |            |                              | 6.4        |        |                              | 4.8    |        |
| pool width ratio                          | w <sub>pool</sub> /w <sub>bkf</sub>                    |            |                              | 1.3        |       |                              | 1.3       |           |                              | 1.3        |        |                              | 1.3            |            |                              | 1.3        |        |                              | 1.3    |        |
|                                           |                                                        |            |                              |            |       |                              |           |           | Pattern                      | ı          |        |                              |                |            |                              |            |        |                              |        |        |
| sinuosity                                 | К                                                      |            |                              | 1.08       |       |                              | 1.29      |           |                              | 1.14       |        |                              | 1.02           |            |                              | 1.02       |        |                              | 1.00   |        |
| belt width<br>meander width ratio         | w <sub>blt</sub><br>w <sub>blt</sub> /w <sub>bkf</sub> | feet       |                              | N/A<br>N/A |       |                              | 46<br>2.9 | 83<br>5.3 |                              | N/A<br>N/A |        | N/A<br>N/A                   |                | N/A<br>N/A |                              | N/A<br>N/A |        |                              |        |        |
| linear wavelength<br>(formerly meander    | LW                                                     | feet       |                              | N/A        |       |                              | 121       | 161       |                              | N/A        |        |                              | N/A            |            |                              | N/A        |        | <u> </u>                     | N/A    |        |
| linear wavelength                         |                                                        |            |                              | -          |       |                              |           |           |                              | -          |        |                              |                |            |                              | -          |        |                              | -      |        |
| ratio (formerly<br>meander length ratio)  | LW/w <sub>bkf</sub>                                    |            | N/A                          |            |       | 7.8                          | 10.3      | N/A       |                              | N/A        |        | N/A                          |                | N/A        |                              |            |        |                              |        |        |
| meander length                            | L <sub>m</sub>                                         | feet       |                              | N/A        |       |                              | 143       | 212       |                              | N/A        |        |                              | N/A            |            |                              | N/A        |        |                              | N/A    |        |
| meander length ratio                      | $L_m/W_{bkf}$                                          |            |                              | N/A        |       |                              | 9.2       | 13.6      | N/A                          |            | N/A    |                              |                | N/A        |                              |            | N/A    |                              |        |        |
| radius of curvature                       | R <sub>c</sub>                                         | feet       |                              | N/A        |       |                              | 28        | 35        |                              | N/A        |        | N/A                          |                |            | N/A                          |            |        | N/A                          |        |        |
| radius of curvature<br>ratio              | $R_c / w_{bkf}$                                        |            |                              | N/A        |       |                              | 1.8       | 2.2       |                              | N/A        |        |                              | N/A            |            |                              | N/A        |        |                              | N/A    |        |

N/A - Does not apply to B type channels

APPENDIX 5 – Categorical Exclusion and Resource Agency Correspondence

# Categorical Exclusion Form for Ecosystem Enhancement Program Projects Version 1.4

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

| Part Part                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | : 1: General Project Information                    |  |  |  |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|--|--|--|--|--|--|
| Project Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Honey Mill Mitigation Site                          |  |  |  |  |  |  |
| County Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Surry County                                        |  |  |  |  |  |  |
| EEP Number:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 100083                                              |  |  |  |  |  |  |
| Project Sponsor:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Wildlands Engineering, Inc.                         |  |  |  |  |  |  |
| Project Contact Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Andrea Eckardt                                      |  |  |  |  |  |  |
| Project Contact Address:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1430 S. Mint Street, Suite 104, Charlotte, NC 28203 |  |  |  |  |  |  |
| Project Contact E-mail:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | aeckardt@wildlandseng.com                           |  |  |  |  |  |  |
| EEP Project Manager:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Kelly Phillips                                      |  |  |  |  |  |  |
| Project Description<br>The Honey Mill Mitigation Site is a stream mitigation project located in Surry County, approximately 5 miles south of<br>Mount Airy and 7 miles northeast of Dobson. The project will include restoration and enhancement of Venable Creek<br>and seven unnamed tributaries which flow to the Ararat River for a total of 5,344 cold stream credits. Historically the<br>site has been used for agriculture. The site is currently used primarily for open and forested cattle pasture. Cattle<br>have full access to all site streams resulting in extensive erosion and incision. The project will provide stream<br>mitigation units to the Division of Mitigation Services in the Yadkin River Basin (03040101) |                                                     |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | For Official Use Only                               |  |  |  |  |  |  |
| Reviewed By:<br>11-1-2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Kelly Phillips                                      |  |  |  |  |  |  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | EEP Project Manager                                 |  |  |  |  |  |  |
| Conditional Approved By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                     |  |  |  |  |  |  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | For Division Administrator<br>FHWA                  |  |  |  |  |  |  |
| Check this box if there are o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | outstanding issues                                  |  |  |  |  |  |  |
| Final Approval By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Ship                                                |  |  |  |  |  |  |
| Date                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | For Division Administrator<br>FHWA                  |  |  |  |  |  |  |

| Part 2: All Projects                                                                                                                                                                                                       |                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| Regulation/Question                                                                                                                                                                                                        | Response               |
| Coastal Zone Management Act (CZMA)                                                                                                                                                                                         |                        |
| 1. Is the project located in a CAMA county?                                                                                                                                                                                | I∐ Yes<br>I∕I No       |
| 2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?                                                                                                                | ☐ Yes<br>☐ No<br>☑ N/A |
| 3. Has a CAMA permit been secured?                                                                                                                                                                                         | ☐ Yes<br>☐ No<br>☑ N/A |
| 4. Has NCDCM agreed that the project is consistent with the NC Coastal Management Program?                                                                                                                                 | ☐ Yes<br>☐ No<br>☑ N/A |
| Comprehensive Environmental Response, Compensation and Liability Act (C                                                                                                                                                    | ERCLA)                 |
| 1. Is this a "full-delivery" project?                                                                                                                                                                                      | ✓ Yes                  |
| 2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial?                                                                                               | ☐ Yes<br>☑ No<br>□ N/A |
| 3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?                                                                            | ☐ Yes<br>☑ No<br>☐ N/A |
| 4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?                                                                                    | ☐ Yes<br>☐ No<br>☑ N/A |
| 5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?                                                                                                  | ☐ Yes<br>☐ No<br>☑ N/A |
| 6. Is there an approved hazardous mitigation plan?                                                                                                                                                                         | ☐ Yes<br>☐ No<br>☑ N/A |
| National Historic Preservation Act (Section 106)                                                                                                                                                                           |                        |
| 1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?                                                                                               | ☐ Yes<br>✓ No          |
| 2. Does the project affect such properties and does the SHPO/THPO concur?                                                                                                                                                  | ☐ Yes<br>☐ No<br>☑ N/A |
| 3. If the effects are adverse, have they been resolved?                                                                                                                                                                    | ☐ Yes<br>☐ No<br>☑ N/A |
| Uniform Relocation Assistance and Real Property Acquisition Policies Act (Un                                                                                                                                               | iform Act)             |
| 1. Is this a "full-delivery" project?                                                                                                                                                                                      | ✓ Yes<br>□ No          |
| 2. Does the project require the acquisition of real estate?                                                                                                                                                                | ✓ Yes<br>□ No<br>□ N/A |
| 3. Was the property acquisition completed prior to the intent to use federal funds?                                                                                                                                        | ☐ Yes<br>☑ No<br>☐ N/A |
| <ul> <li>4. Has the owner of the property been informed:</li> <li>* prior to making an offer that the agency does not have condemnation authority; and</li> <li>* what the fair market value is believed to be?</li> </ul> | ✓ Yes<br>□ No<br>□ N/A |

| Part 3: Ground-Disturbing Activities                                                                                        | _                        |
|-----------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Regulation/Question                                                                                                         | Response                 |
| 1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?                       | ☐ Yes<br>☑ No            |
| 2. Is the site of religious importance to American Indians?                                                                 |                          |
|                                                                                                                             | ☑ N/A                    |
| 3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?                          | │ Yes<br>│ No<br>☑ N/A   |
| 4. Have the effects of the project on this site been considered?                                                            | ☐ Yes<br>☐ No<br>☑ N/A   |
| Antiquities Act (AA)                                                                                                        |                          |
| 1. Is the project located on Federal lands?                                                                                 |                          |
| 2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?                   | ☐ Yes<br>☐ No<br>☑ N/A   |
| 3. Will a permit from the appropriate Federal agency be required?                                                           | ☐ Yes<br>☐ No<br>☑ N/A   |
| 4. Has a permit been obtained?                                                                                              | ☐ Yes<br>☐ No<br>☑ N/A   |
| Archaeological Resources Protection Act (ARPA)                                                                              |                          |
| 1. Is the project located on federal or Indian lands (reservation)?                                                         | ☐ Yes<br>☑ No            |
| 2. Will there be a loss or destruction of archaeological resources?                                                         | │ Yes<br>│ No<br>  ∕ N/A |
| 3. Will a permit from the appropriate Federal agency be required?                                                           | ☐ Yes<br>☐ No<br>☑ N/A   |
| 4. Has a permit been obtained?                                                                                              |                          |
| Endangered Species Act (ESA)                                                                                                |                          |
| 1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?                  | ✓ Yes<br>□ No            |
| 2. Is Designated Critical Habitat or suitable habitat present for listed species?                                           | Yes     No     N/A       |
| 3. Are T&E species present or is the project being conducted in Designated Critical Habitat?                                | ☐ Yes<br>☑ No<br>□ N/A   |
| 4. Is the project "likely to adversely affect" the species and/or "likely to adversely modify" Designated Critical Habitat? | ☐ Yes<br>☐ No<br>☑ N/A   |
| 5. Does the USFWS/NOAA-Fisheries concur in the effects determination?                                                       | ☐ Yes<br>☐ No<br>☑ N/A   |
| 6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?                                                        | │ Yes<br>│ No<br>☑ N/A   |

| Executive Order 13007 (Indian Sacred Sites)                                                                 |                        |
|-------------------------------------------------------------------------------------------------------------|------------------------|
| 1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?     | ☐ Yes<br>✓ No          |
| 2. Has the EBCI indicated that Indian sacred sites may be impacted by the proposed project?                 | Yes                    |
| 3. Have accommodations been made for access to and ceremonial use of Indian sacred sites?                   | I VA<br>Ves<br>No      |
|                                                                                                             | ☑ N/A                  |
| Farmland Protection Policy Act (FPPA)                                                                       |                        |
| 1. Will real estate be acquired?                                                                            | I Yes<br>I No          |
| 2. Has NRCS determined that the project contains prime, unique, statewide or locally important farmland?    | ✓ Yes<br>□ No<br>□ N/A |
| 3. Has the completed Form AD-1006 been submitted to NRCS?                                                   | I Yes<br>I No<br>I N/A |
| Fish and Wildlife Coordination Act (FWCA)                                                                   |                        |
| 1. Will the project impound, divert, channel deepen, or otherwise control/modify any water body?            | ✓ Yes<br>□ No          |
| 2. Have the USFWS and the NCWRC been consulted?                                                             | ✓ Yes<br>□ No<br>□ N/A |
| Land and Water Conservation Fund Act (Section 6(f))                                                         |                        |
| 1. Will the project require the conversion of such property to a use other than public, outdoor recreation? | ☐ Yes<br>☑ No          |
| 2. Has the NPS approved of the conversion?                                                                  |                        |
|                                                                                                             | ☑ N/A                  |
| Magnuson-Stevens Fishery Conservation and Management Act (Essential Fisher)                                 | n Habitat <u>)</u>     |
| 1. Is the project located in an estuarine system?                                                           | ☐ Yes<br>☑ No          |
| 2. Is suitable habitat present for EFH-protected species?                                                   | ☐ Yes<br>☐ No<br>☑ N/A |
| 3. Is sufficient design information available to make a determination of the effect of the project on EFH?  | ☐ Yes<br>☐ No<br>☑ N/A |
| 4. Will the project adversely affect EFH?                                                                   | ☐ Yes<br>☐ No<br>☑ N/A |
| 5. Has consultation with NOAA-Fisheries occurred?                                                           | ☐ Yes<br>☐ No<br>☑ N/A |
| Migratory Bird Treaty Act (MBTA)                                                                            |                        |
| 1. Does the USFWS have any recommendations with the project relative to the MBTA?                           | ☐ Yes<br>✓ No          |
| 2. Have the USFWS recommendations been incorporated?                                                        | ☐ Yes<br>☐ No<br>☑ N/A |
| Wilderness Act                                                                                              |                        |
| 1. Is the project in a Wilderness area?                                                                     | ☐ Yes                  |
| 2. Has a special upp permit and/or appement been obtained from the maintaining                              |                        |
| federal agency?                                                                                             | □ res<br>□ No<br>☑ N/A |

Honey Mill Mitigation Site Categorical Exclusion SUMMARY

# Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment.

As the Honey Mill Mitigation Site is a full-delivery project; an EDR Radius Map Report with Geocheck was ordered for the site through Environmental Data Resources, Inc on July 30, 2018. Neither the target property nor the adjacent properties were listed in any of the Federal, State, or Tribal environmental databases searched by the EDR. The assessment revealed no evidence of any "recognized environmental conditions" in connection with the target property. The Executive Summary of the EDR report is included in the Appendix. The full report is available if needed.

# National Historic Preservation Act (Section 106)

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

Wildlands Engineering, Inc. (Wildlands) requested review and comment from the State Historic Preservation Office (SHPO) with respect to any archeological and architectural resources related to the Honey Mill Mitigation Site on July 30, 2018. SHPO responded on September 10, 2018 and stated they were aware of "no historic resources which would be affected by the project" and would have no further comment. All correspondence related to Section 106 is included in the Appendix.

# Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)

These acts, collectively known as the Uniform Act, provide for uniform and equitable treatment of persons displaced from their homes, businesses, non-profit associations, or farms by federal and federally-assisted programs, and establish uniform and equitable land acquisition policies.

Honey Mill Mitigation Site is a full-delivery project that includes land acquisition. Notification of the fair market value of the project property and the lack of condemnation authority by Wildlands was included in the signed Option Agreement for the project property. A copy of the relevant section of the Option Agreement is included in the Appendix.

## **Endangered Species Act (ESA)**

Section 7 of the ESA requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior or of Commerce, as appropriate, to ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species.

The Surry County listed threatened and endangered species includes the Northern long-eared bat (NLEB) (*Myotis septentrionalis*), the bog turtle (*Glyptemys muhlenbergii*), Schweinitz's sunflower (*Helianthus schweinitzii*), and the small whorled pogonia (*Isotria medeoloides*). The USFWS does not currently list any Critical Habitat Designations for the Federally-listed species within Surry County nor are there any known occurrences of the NLEB documented within the County

(https://www.fws.gov/asheville/htmls/project\_review/NLEB\_in\_WNC.html). The project site is 70 miles from the nearest known hibernaculum for the NLEB.


A pedestrian survey, conducted on August 31, 2018, indicated that the Site provides suitable habitat for the Northern long-eared bat, the bog turtle, and Schweinitz's sunflower. There was no suitable habitat on the Site for the small whorled pogonia. No individual species were located on the Site for any of the four listed species.

Due to the absence of individual species on the site, the project has been determined by Wildlands to have "no effect" on the Schweinitz's sunflower and the small whorled pogonia. Wildlands determined that the project "may affect but is not likely to adversely affect" the bog turtle, but because it is listed as threatened due to similarity of appearance, it is not subject to Section 7 consultation.

Forested habitats containing trees at least 3-inch dbh in the project area provide suitable habitat for NLEB. Due to the decline of the NLEB population from the White Nosed Syndrome (WNS), the US Fish and Wildlife Service (USFWS) has issued the finalization of a special rule under section 4(d) of the ESA to addresses the effects to the NLEB resulting from purposeful and incidental take based on the occurrence of WNS. Because the project is located within a WNS zone and will include the removal/clearing of trees, it is subject to the final 4(d) ruling. A review of NC Natural Heritage Program records did not indicate any known NLEB populations within 2.0 mile of the study area; therefore, the project is eligible to use the NLEB 4(d) Rule Streamlined Consultation Form to meet regulatory requirements for section 7(a)(2) compliance 4(d) consultation. The completed 4(d) Consultation Form was submitted to the USFWS by the Federal Highway Administration on September 20, 2018.

To meet regulatory requirements, a letter requesting comment from the USFWS was sent on July 20, 2018. No response from the USFWS was received within the 30-day response period. Therefore, the signing of the NLEB 4(d) Rule Streamlined Consultation Form by the FHWA determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule. A FHWA signed 4(d) consultation form and the correspondence associated with this determination are included in the Appendix.

### Farmland Protection Policy Act (FPPA)

The FPPA requires that, before taking or approving any federal action that would result in conversion of farmland, the agency must examine the effects of the action using the criteria set forth in the FPPA, and, if there are adverse effects, must consider alternatives to lessen them.

The Honey Mill Mitigation Site includes the conversion of prime farmland. As such, Form AD-1006 has been completed and submitted to the Natural Resources Conservation Service (NRCS). The completed form and correspondence documenting its submittal is included in the Appendix.

### Fish and Wildlife Coordination Act (FWCA)

The FWCA requires consultation with the USFWS and the appropriate state wildlife agency on projects that alter or modify a water body. Reports and recommendations prepared by these agencies document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources.

Wildlands requested comment on the project from both the USFWS and the North Carolina Wildlife Resources Commission (NCWRC) on July 30, 2018. NCWRC responded on August 8, 2018 and stated that the project would "not impact wild trout resources". USFWS has not responded at this time. All correspondence with the two agencies is included in the Appendix.



### **Migratory Bird Treaty Act (MBTA)**

The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. The indirect killing of birds by destroying their nests and eggs is covered by the MBTA, so construction in nesting areas during nesting seasons can constitute a taking.

Wildlands requested comment on the Honey Mill Mitigation Site from the USFWS in regards to migratory birds on June 30, 2018. The USFWS has not responded at this time. All correspondence with USFWS is included in the Appendix.



Honey Mill Mitigation Site Categorical Exclusion

## APPENDIX

**Honey Mill Mitigation Site** 

Venable Farm Road Mount Airy, NC 27030

Inquiry Number: 5376953.2s July 30, 2018

# The EDR Radius Map<sup>™</sup> Report with GeoCheck®



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

FORM-LBD-CCA

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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

VENABLE FARM ROAD MOUNT AIRY, NC 27030

#### COORDINATES

| Latitude (North):             | 36.4300000 - 36° 25' 48.00'' |
|-------------------------------|------------------------------|
| Longitude (West):             | 80.6110000 - 80° 36' 39.60'' |
| Universal Tranverse Mercator: | Zone 17                      |
| UTM X (Meters):               | 534869.2                     |
| UTM Y (Meters):               | 4031512.0                    |
| Elevation:                    | 1048 ft. above sea level     |

#### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: Version Date: 6045899 MOUNT AIRY SOUTH, NC 2014

5947705 DOBSON, NC 2013

#### **AERIAL PHOTOGRAPHY IN THIS REPORT**

West Map: Version Date:

| Portions of Photo from: | 20140524 |
|-------------------------|----------|
| Source:                 | USDA     |

DATABASE ACRONYMS

Target Property Address: VENABLE FARM ROAD MOUNT AIRY, NC 27030

Click on Map ID to see full detail.

MAP ID SITE NAME

ADDRESS

NO MAPPED SITES FOUND

RELATIVE DIST (ft. & mi.) ELEVATION DIRECTION

### **EXECUTIVE SUMMARY**

There were no unmapped sites in this report.

### **OVERVIEW MAP - 5376953.2S**



| SITE NAME:<br>ADDRESS:<br>LAT/LONG: | Honey Mill Mitigation Site<br>Venable Farm Road<br>Mount Airy NC 27030<br>36.43 / 80.611 | CLIENT:<br>CONTACT:<br>INQUIRY #:<br>DATE: | Wildlands Eng, Inc.<br>Tasha King<br>5376953.2s<br>July 30, 2018 3:22 pm |
|-------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------------|
|                                     |                                                                                          | 0                                          |                                                                          |



| Database                                              | Search<br>Distance<br>(Miles) | Target<br>Property | < 1/8        | 1/8 - 1/4    | 1/4 - 1/2      | 1/2 - 1        | > 1            | Total<br>Plotted |
|-------------------------------------------------------|-------------------------------|--------------------|--------------|--------------|----------------|----------------|----------------|------------------|
| STANDARD ENVIRONMEN                                   | TAL RECORDS                   |                    |              |              |                |                |                |                  |
| Federal NPL site list                                 |                               |                    |              |              |                |                |                |                  |
| NPL<br>Proposed NPL<br>NPL LIENS                      | 1.000<br>1.000<br>TP          |                    | 0<br>0<br>NR | 0<br>0<br>NR | 0<br>0<br>NR   | 0<br>0<br>NR   | NR<br>NR<br>NR | 0<br>0<br>0      |
| Federal Delisted NPL si                               | te list                       |                    |              |              |                |                |                |                  |
| Delisted NPL                                          | 1.000                         |                    | 0            | 0            | 0              | 0              | NR             | 0                |
| Federal CERCLIS list                                  |                               |                    |              |              |                |                |                |                  |
| FEDERAL FACILITY<br>SEMS                              | 0.500<br>0.500                |                    | 0<br>0       | 0<br>0       | 0<br>0         | NR<br>NR       | NR<br>NR       | 0<br>0           |
| Federal CERCLIS NFRA                                  | P site list                   |                    |              |              |                |                |                |                  |
| SEMS-ARCHIVE                                          | 0.500                         |                    | 0            | 0            | 0              | NR             | NR             | 0                |
| Federal RCRA CORRAC                                   | TS facilities li              | ist                |              |              |                |                |                |                  |
| CORRACTS                                              | 1.000                         |                    | 0            | 0            | 0              | 0              | NR             | 0                |
| Federal RCRA non-COR                                  | RACTS TSD f                   | acilities list     |              |              |                |                |                |                  |
| RCRA-TSDF                                             | 0.500                         |                    | 0            | 0            | 0              | NR             | NR             | 0                |
| Federal RCRA generato                                 | rs list                       |                    |              |              |                |                |                |                  |
| RCRA-LQG<br>RCRA-SQG<br>RCRA-CESQG                    | 0.250<br>0.250<br>0.250       |                    | 0<br>0<br>0  | 0<br>0<br>0  | NR<br>NR<br>NR | NR<br>NR<br>NR | NR<br>NR<br>NR | 0<br>0<br>0      |
| Federal institutional cor<br>engineering controls re  | ntrols /<br>gistries          |                    |              |              |                |                |                |                  |
| LUCIS<br>US ENG CONTROLS<br>US INST CONTROL           | 0.500<br>0.500<br>0.500       |                    | 0<br>0<br>0  | 0<br>0<br>0  | 0<br>0<br>0    | NR<br>NR<br>NR | NR<br>NR<br>NR | 0<br>0<br>0      |
| Federal ERNS list                                     |                               |                    |              |              |                |                |                |                  |
| ERNS                                                  | TP                            |                    | NR           | NR           | NR             | NR             | NR             | 0                |
| State- and tribal - equiva                            | alent NPL                     |                    |              |              |                |                |                |                  |
| NC HSDS                                               | 1.000                         |                    | 0            | 0            | 0              | 0              | NR             | 0                |
| State- and tribal - equiva                            | alent CERCLIS                 | S                  |              |              |                |                |                |                  |
| SHWS                                                  | 1.000                         |                    | 0            | 0            | 0              | 0              | NR             | 0                |
| State and tribal landfill a solid waste disposal site | and/or<br>e lists             |                    |              |              |                |                |                |                  |
| SWF/LF<br>OLI                                         | 0.500<br>0.500                |                    | 0<br>0       | 0<br>0       | 0<br>0         | NR<br>NR       | NR<br>NR       | 0<br>0           |
| State and tribal leaking                              | storage tank l                | lists              |              |              |                |                |                |                  |
| LAST                                                  | 0.500                         |                    | 0            | 0            | 0              | NR             | NR             | 0                |

| Database                                                                   | Search<br>Distance<br>(Miles)                      | Target<br>Property | < 1/8                     | 1/8 - 1/4                 | 1/4 - 1/2                 | 1/2 - 1                    | > 1                        | Total<br>Plotted      |
|----------------------------------------------------------------------------|----------------------------------------------------|--------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|-----------------------|
| LUST<br>INDIAN LUST<br>LUST TRUST                                          | 0.500<br>0.500<br>0.500                            |                    | 0<br>0<br>0               | 0<br>0<br>0               | 0<br>0<br>0               | NR<br>NR<br>NR             | NR<br>NR<br>NR             | 0<br>0<br>0           |
| State and tribal register                                                  | ed storage tar                                     | nk lists           |                           |                           |                           |                            |                            |                       |
| FEMA UST<br>UST<br>AST<br>INDIAN UST                                       | 0.250<br>0.250<br>0.250<br>0.250                   |                    | 0<br>0<br>0<br>0          | 0<br>0<br>0<br>0          | NR<br>NR<br>NR<br>NR      | NR<br>NR<br>NR<br>NR       | NR<br>NR<br>NR<br>NR       | 0<br>0<br>0<br>0      |
| State and tribal instituti control / engineering co                        | onal<br>ontrol registrie                           | s                  |                           |                           |                           |                            |                            |                       |
| INST CONTROL                                                               | 0.500                                              |                    | 0                         | 0                         | 0                         | NR                         | NR                         | 0                     |
| State and tribal volunta                                                   | ry cleanup site                                    | es                 |                           |                           |                           |                            |                            |                       |
| INDIAN VCP<br>VCP                                                          | 0.500<br>0.500                                     |                    | 0<br>0                    | 0<br>0                    | 0<br>0                    | NR<br>NR                   | NR<br>NR                   | 0<br>0                |
| State and tribal Brownfi                                                   | ields sites                                        |                    |                           |                           |                           |                            |                            |                       |
| BROWNFIELDS                                                                | 0.500                                              |                    | 0                         | 0                         | 0                         | NR                         | NR                         | 0                     |
| ADDITIONAL ENVIRONME                                                       | NTAL RECORD                                        | <u>s</u>           |                           |                           |                           |                            |                            |                       |
| Local Brownfield lists                                                     |                                                    |                    |                           |                           |                           |                            |                            |                       |
| US BROWNFIELDS                                                             | 0.500                                              |                    | 0                         | 0                         | 0                         | NR                         | NR                         | 0                     |
| Local Lists of Landfill /<br>Waste Disposal Sites                          | Solid                                              |                    |                           |                           |                           |                            |                            |                       |
| SWRCY<br>HIST LF<br>INDIAN ODI<br>DEBRIS REGION 9<br>ODI<br>IHS OPEN DUMPS | 0.500<br>0.500<br>0.500<br>0.500<br>0.500<br>0.500 |                    | 0<br>0<br>0<br>0<br>0     | 0<br>0<br>0<br>0<br>0     | 0<br>0<br>0<br>0<br>0     | NR<br>NR<br>NR<br>NR<br>NR | NR<br>NR<br>NR<br>NR<br>NR | 0<br>0<br>0<br>0<br>0 |
| Local Lists of Hazardou<br>Contaminated Sites                              | is waste /                                         |                    |                           |                           |                           |                            |                            |                       |
| US HIST CDL<br>US CDL                                                      | TP<br>TP                                           |                    | NR<br>NR                  | NR<br>NR                  | NR<br>NR                  | NR<br>NR                   | NR<br>NR                   | 0<br>0                |
| Local Land Records                                                         |                                                    |                    |                           |                           |                           |                            |                            |                       |
| LIENS 2                                                                    | TP                                                 |                    | NR                        | NR                        | NR                        | NR                         | NR                         | 0                     |
| Records of Emergency                                                       | Release Repo                                       | orts               |                           |                           |                           |                            |                            |                       |
| HMIRS<br>SPILLS<br>IMD<br>SPILLS 90<br>SPILLS 80                           | TP<br>TP<br>0.500<br>TP<br>TP                      |                    | NR<br>NR<br>0<br>NR<br>NR | NR<br>NR<br>0<br>NR<br>NR | NR<br>NR<br>0<br>NR<br>NR | NR<br>NR<br>NR<br>NR<br>NR | NR<br>NR<br>NR<br>NR<br>NR | 0<br>0<br>0<br>0      |
| Other Ascertainable Re                                                     | cords                                              |                    |                           |                           |                           |                            |                            |                       |
| RCRA NonGen / NLR                                                          | 0.250                                              |                    | 0                         | 0                         | NR                        | NR                         | NR                         | 0                     |

| Database                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Search<br>Distance<br>(Miles)                                                                            | Target<br>Property | < 1/8                                   | 1/8 - 1/4                               | 1/4 - 1/2                                           | 1/2 - 1                                 | > 1                                     | Total<br>Plotted |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------------------|-----------------------------------------|-----------------------------------------|------------------|
| FUDS<br>DOD<br>SCRD DRYCLEANERS<br>US FIN ASSUR<br>EPA WATCH LIST<br>2020 COR ACTION<br>TSCA<br>TRIS<br>SSTS<br>ROD<br>RMP<br>RAATS<br>PRP<br>PADS<br>ICIS<br>FTTS<br>MLTS<br>COAL ASH DOE<br>COAL ASH DOE<br>COAL ASH EPA<br>PCB TRANSFORMER<br>RADINFO<br>HIST FTTS<br>DOT OPS<br>CONSENT<br>INDIAN RESERV<br>FUSRAP<br>UMTRA<br>LEAD SMELTERS<br>US AIRS<br>US MINES<br>ABANDONED MINES<br>FINDS<br>ECHO<br>DOCKET HWC<br>UXO<br>FUELS PROGRAM<br>AIRS<br>ASBESTOS<br>COAL ASH<br>DRYCLEANERS<br>Financial Assurance<br>NPDES<br>UIC<br>AOP | 1.000<br>1.000<br>0.500<br>TP<br>TP<br>0.250<br>TP<br>TP<br>TP<br>TP<br>TP<br>TP<br>TP<br>TP<br>TP<br>TP |                    | 0 0 0 RR 0 RR R 0 R R R R R R R R R R R | ОООRRORRRORRRRRRRRORRROOOORROORRROORROO | 0 0 0 RRRRR R 0 R RRRRRR R 0 RRRRR R 0 0 0 0 RRRRRR | 0 0 R R R R R R R R R R R R R R R R R R | ŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŔŎŎŎŎŎŎ |                  |
| EDR MGP<br>EDR Hist Auto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 1.000<br>0.125                                                                                           |                    | 0<br>0                                  | 0<br>NR                                 | 0<br>NR                                             | 0<br>NR                                 | NR<br>NR                                | 0<br>0           |

| Database                      | Search<br>Distance<br>(Miles) | Target<br>Property | < 1/8          | 1/8 - 1/4      | 1/4 - 1/2      | 1/2 - 1        | > 1            | Total<br>Plotted |
|-------------------------------|-------------------------------|--------------------|----------------|----------------|----------------|----------------|----------------|------------------|
| EDR Hist Cleaner              | 0.125                         |                    | 0              | NR             | NR             | NR             | NR             | 0                |
| EDR RECOVERED GOVERN          |                               | /ES                |                |                |                |                |                |                  |
| Exclusive Recovered Go        | ovt. Archives                 |                    |                |                |                |                |                |                  |
| RGA HWS<br>RGA LF<br>RGA LUST | TP<br>TP<br>TP                |                    | NR<br>NR<br>NR | NR<br>NR<br>NR | NR<br>NR<br>NR | NR<br>NR<br>NR | NR<br>NR<br>NR | 0<br>0<br>0      |
| - Totals                      |                               | 0                  | 0              | 0              | 0              | 0              | 0              | 0                |

#### NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Elevation Site MAP FINDINGS

Database(s)

EDR ID Number EPA ID Number

NO SITES FOUND

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|------|--------|-----------|--------------|-----|-------------|
|      |        |           |              |     |             |

TC5376953.2s Page 9



July 30, 2018

Renee Gledhill-Earley State Historic Preservation Office 4617 Mail Service Center Raleigh, NC 27699-4617

Subject: Honey Mill Mitigation Site Surry County, North Carolina

Dear Ms. Gledhill-Earley,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with the Honey Mill Mitigation Site, a stream mitigation site located in Surry County, NC. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Mount Airy South, 7.5-Minute USGS Topographic Quadrangle, and the site is located at latitude 36.429798, longitude -80.610641.

The Honey Mill Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel impacts. This project will include stream restoration and enhancement of Venable Creek and seven unnamed tributaries, which all flow to Ararat River. Several sections of channel have been identified as significantly degraded, primarily due to its use as cattle pasture. Cattle have full access to the streams which has resulted in extensive erosion and incision. Historically, the site has been in active agricultural production for over 60 years. Furthermore, no archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes.

We ask that you review this site based on the attached information to determine the presence of any historic properties.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the project.

Sincerely,

Tasha King Environmental Scientist

<u>Attachment</u>: Figure 1 Site Map Figure 2 USGS Topographic Map





North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper Secretary Susi H. Hamilton

September 10, 2018

Tasha King Wildlands Engineering 1430 South Mint Street, Suite 104 Charlotte, NC 28203

Re: Honey Mill Mitigation Site, Surry County, ER 18-2061

Dear Ms. King:

Thank you for your letter of July 30, 2018, 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 <u>environmental.review@ncdcr.gov</u>. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Rence Gledhill-Earley

Ramona M. Bartos

Office of Archives and History Deputy Secretary Kevin Cherry 3.9 Value of Conservation Easement; No Power of Eminent Domain. In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Buyer hereby notifies Seller that: (i) Buyer believes that the fair market value of the Conservation Easement is an amount equal to the Purchase Price; and (ii) Buyer does not have the power of eminent domain.

3.10 **Modification; Waiver.** No amendment of this agreement will be effective unless it is in writing and signed by the parties. No waiver of satisfaction of a condition or failure to comply with an obligation under this agreement will be effective unless it is in writing and signed by the party granting the waiver, and no such waiver will constitute a waiver of satisfaction of any other condition or failure to comply with any other obligation.

3.11 **Attorneys' Fees.** If either party commences an action against the other to interpret or enforce any of the terms of this agreement or because of the breach by the other party of any of the terms of this agreement, the losing party shall pay to the prevailing party reasonable attorneys' fees, expenses, court costs, litigation costs and any other expenses incurred in connection with the prosecution or defense of such action, whether or not the action is prosecuted to a final judgment.

3.12 **Memorandum of Option Agreement.** Concurrently with the signing of this agreement, Buyer and Seller agree to sign a Memorandum of Option that will be recorded against the Property in the Register of Deeds in the County stated in paragraph A within five days after the Effective Date.

3.13 **Tax Deferred Exchange**. If Seller desires to implement a tax-deferred exchange (the "**Exchange**") in connection with Buyer's purchase of the Conservation Easement, the parties agree to cooperate in affecting the Exchange. Seller is responsible for all additional costs associated with the Exchange and Buyer shall not have any additional liability with respect to the Exchange. The parties will execute any additional documents required for the Exchange at no cost to Buyer.

3.14 **Brokers.** Shawn D. Wilkerson and Robert W. Bugg are North Carolina Real Estate Brokers. Neither Buyer nor Seller has incurred any liability for any brokerage fee, commission or finder's fee in connection with this agreement or the transactions contemplated by this agreement.

3.15 **Entire Agreement.** Each party acknowledges they are not relying on any statements made by the other party, other than in this agreement, regarding the subject matter of this agreement. Neither party will have a basis for bringing any claim for fraud in connection with any such statements.

3.16 **Mutual Agreement.** This is a mutually negotiated agreement and regardless of which party was more responsible for its preparation, this agreement shall be construed neutrally between the parties.

3.17 **Governing Law.** The laws of the State of North Carolina, without giving effect to its principles of conflicts of law, govern all matters arising out of this agreement.

3.18 **Counterparts.** This agreement may be signed in counterparts, each of which shall be deemed an original, but all of which, together, constitute one and the same instrument. A signed copy of this agreement delivered by electronic mail in portable document format (".pdf" format) shall have the same legal effect as delivery of an original signed copy of this agreement.

Seller

[Signature Page Below]

Seller shall work together to identify the best location for the final route and to decide if the route shall remain after construction of the project or not. Buyer shall leave the Construction Access Route in equal or better condition than it existed prior to the start of construction activities. This paragraph survives Closing.

3.5 **Liquidated Damages.** Buyer recognizes that the Project Area will be removed by Seller from the market during the term of the agreement. If the purchase of the Conservation Easement is not consummated due to Buyer's default, the parties have determined and agreed that the actual amount of damages that would be suffered by Seller as a result of that default would be very difficult or impracticable to estimate on the date of this agreement. As a result, the parties agree that the Option Consideration as of the date of Buyer's default is sufficient to cover any estimated damages that may be incurred by Seller. For these reasons, the parties agree that if the purchase of the Conservation Easement is not consummated because of Buyer's default, Seller may retain the Option Consideration paid by Buyer as of the date of Buyer's default as its sole remedy, and Seller waives any and all right to seek other rights or remedies against Buyer, including without limitation, specific performance. Nothing stated in this paragraph shall preclude any action under any indemnification or defense provision in this agreement, nor for the award of attorney's fees and costs in conjunction with any action relating to this agreement.

3.6 **Notices.** All notices required by this agreement shall be in writing, shall be given only in accordance with the provisions of this Section, shall be addressed to the Parties in the manner stated below, and shall be conclusively deemed properly delivered: (a) upon receipt when hand delivered during normal business hours; (b) upon the day of delivery if the notice has been deposited in an authorized receptacle of the United States Postal Service as first-class, registered or certified mail, postage prepaid, with a return receipt requested; (c) one business day after the notice has been deposited with either FedEx or United Parcel Service to be delivered by overnight delivery; or (d) if sent by email, upon receipt of an acknowledgement email sent to the sender's email address in which the party receiving the email notice acknowledges having received that email. An automatic "read receipt" is not acknowledgement for purposes of this section 3.3. The addresses of the parties to receive notices are as follows:

| TO BUYER:  | Wildlands Engineering, Inc.       |
|------------|-----------------------------------|
|            | 1430 S. Mint Street, Suite 104    |
|            | Charlotte, North Carolina 28203   |
|            | Attention: Robert W. Bugg         |
|            | e-mail: rbugg@wildlandseng.com    |
| TO SELLER: | LuAnn Venable Browne              |
|            | 929 Siloam Road                   |
|            | Mt. Airy, NC 27030                |
|            | e-mail: luannbrowne@mcacademy.com |

Notice of change of address shall be given by written notice in the manner described in this paragraph.

3.7 **Assignment.** Buyer has the right to assign this agreement without the consent of Seller. No assignment shall be effective unless the assignee has delivered to Seller a written assumption of Buyer's obligations under this agreement. Seller hereby releases Buyer from any obligations under this agreement arising after the effective date of any assignment of this agreement by Buyer.

3.8 Value of Conservation Easement; No Power of Eminent Domain. In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Buyer hereby notifies Seller that: (i) Buyer

Buyer CB\_Seller 2000 Seller

believes that the fair market value of the Conservation Easement is an amount equal to the Purchase Price; and (ii) Buyer does not have the power of eminent domain.

3.9 **Modification; Waiver.** No amendment of this agreement will be effective unless it is in writing and signed by the parties. No waiver of satisfaction of a condition or failure to comply with an obligation under this agreement will be effective unless it is in writing and signed by the party granting the waiver, and no such waiver will constitute a waiver of satisfaction of any other condition or failure to comply with any other obligation.

3.10 **Attorneys' Fees.** If either party commences an action against the other to interpret or enforce any of the terms of this agreement or because of the breach by the other party of any of the terms of this agreement, the losing party shall pay to the prevailing party reasonable attorneys' fees, expenses, court costs, litigation costs and any other expenses incurred in connection with the prosecution or defense of such action, whether or not the action is prosecuted to a final judgment.

3.11 **Memorandum of Option Agreement.** Concurrently with the signing of this agreement, Buyer and Seller agree to sign a Memorandum of Option that will be recorded against the Property in the Register of Deeds in the County stated in paragraph A within five days after the Effective Date.

3.12 **Tax Deferred Exchange**. If Seller desires to implement a tax-deferred exchange (the "**Exchange**") in connection with Buyer's purchase of the Conservation Easement, the parties agree to cooperate in affecting the Exchange. Seller is responsible for all additional costs associated with the Exchange and Buyer shall not have any additional liability with respect to the Exchange. The parties will execute any additional documents required for the Exchange at no cost to Buyer.

3.13 **Brokers**. Shawn D. Wilkerson and Robert W. Bugg are North Carolina Real Estate Brokers. Neither Buyer nor Seller has incurred any liability for any brokerage fee, commission or finder's fee in connection with this agreement or the transactions contemplated by this agreement.

3.14 **Entire Agreement.** Each party acknowledges they are not relying on any statements made by the other party, other than in this agreement, regarding the subject matter of this agreement. Neither party will have a basis for bringing any claim for fraud in connection with any such statements.

3.15 **Mutual Agreement.** This is a mutually negotiated agreement and regardless of which party was more responsible for its preparation, this agreement shall be construed neutrally between the parties.

3.16 **Governing Law.** The laws of the State of North Carolina, without giving effect to its principles of conflicts of law, govern all matters arising out of this agreement.

3.17 **Counterparts.** This agreement may be signed in counterparts, each of which shall be deemed an original, but all of which, together, constitute one and the same instrument. A signed copy of this agreement delivered by electronic mail in portable document format (".pdf" format) shall have the same legal effect as delivery of an original signed copy of this agreement.

[Signature Page Below]

Buyer Seller UVP Seller

7



July 30, 2018

Marella Buncick US Fish and Wildlife Service Asheville Field Office 160 Zillicoa Street Asheville, NC 28801

Subject: Honey Mill Mitigation Site Surry County, North Carolina

Dear Ms. Buncick,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to endangered species, migratory birds, or other trust resources associated with the proposed Honey Mill Mitigation Site, a stream mitigation site located in Surry County, NC. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Mount Airy South, 7.5-Minute USGS Topographic Quadrangle, and the site is located at latitude 36.429798, longitude -80.610641.

The Honey Mill Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel impacts. This project will include stream restoration and enhancement of Venable Creek and seven unnamed tributaries, which all flow to Ararat River. Several sections of channel have been identified as significantly degraded, primarily due to its use as cattle pasture. Cattle have full access to the streams which has resulted in extensive erosion and incision.

According to your website (https://www.fws.gov/raleigh/species/cntylist/surry.html) the threatened or endangered species for Surry County are: the northern long-eared bat (*Myotis septentrionalis*), the bog turtle (*Glyptemys muhlenbergii*), Schweinitz's sunflower (*Helianthus schweinitzii*), and the small whorled pogonia (*Isotria medeoloides*).

If we have not heard from you in 30 days, we will assume that you do not have any comments regarding associated laws and that you do not have any information relevant to this project at the current time.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning this project.

Sincerely,

Tasha King Environmental Scientist

<u>Attachment</u>: Figure 1 Site Map Figure 2 USGS Topographic Map



### Andrea Eckardt

| From:        | Brew, Donnie (FHWA) <donnie.brew@dot.gov></donnie.brew@dot.gov>                                    |
|--------------|----------------------------------------------------------------------------------------------------|
| Sent:        | Thursday, September 20, 2018 3:14 PM                                                               |
| То:          | Marella_Buncick@fws.gov                                                                            |
| Cc:          | Andrea Eckardt; Phillips, Kelly D                                                                  |
| Subject:     | Honey Mill site DMS_mitigation project_Surry County_NLEB 4(d) rule consultation                    |
| Attachments: | NLEB 4(d) rule streamlined consultation form Honey Mill site 9-20-18.pdf; Honey Mill Figure 1 Site |
|              | Map.pdf; Honey Mill Figure 2 Topo Map.pdf; Honey Mill Figure 3 Concept Map for NLEB.pdf            |

### Good afternoon Marella,

The purpose of this message is to notify your office that FHWA will use the streamlined consultation framework for the Honey Mill Mitigation Site in Surry County, NC.

Attached is a completed NLEB 4(d) Rule Streamlined Consultation form, as well as site maps/figures.

Thank you and have a great afternoon,

Donnie

### Notifying the Service Under the Framework

### Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies (or designated non-federal representatives) should use the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation form to notify the Service of their project and meet the requirements of the framework.

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form (Word document)

Information requested in the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form serves to

(1) notify the field office that an action agency will use the streamlined framework;

(2) describe the project with sufficient detail to support the required determination; and

(3) enable the USFWS to track effects and determine if reinitiation of consultation for the 4(d) rule is required. This form requests the minimum amount of information required for the Service to be able to track this information.

Providing information in the Streamlined Consultation Form does not address section 7(a)(2) compliance for any other listed species.

Donnie Brew Preconstruction & Environment Engineer Federal Highway Administration 310 New Bern Ave, Suite 410 Raleigh, NC 27601 donnie.brew@dot.gov 919-747-7017

\*\*\*Please consider the environment before printing this email.\*\*\*

### Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern longeared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

| Info | YES                                                                                                                                                                           | NO          |             |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------|
| 1.   | Does the project occur wholly outside of the WNS Zone <sup>1</sup> ?                                                                                                          |             | $\boxtimes$ |
| 2.   | Have you contacted the appropriate agency <sup>2</sup> to determine if your project is near known hibernacula or maternity roost trees?                                       | $\boxtimes$ |             |
| 3.   | Could the project disturb hibernating NLEBs in a known hibernaculum?                                                                                                          |             | $\boxtimes$ |
| 4.   | Could the project alter the entrance or interior environment of a known hibernaculum?                                                                                         |             | $\boxtimes$ |
| 5.   | Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?                                                                              |             | $\boxtimes$ |
| 6.   | Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31. |             | $\boxtimes$ |

You are eligible to use this form if you have answered yes to question #1 <u>or</u> yes to question #2 <u>and</u> no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant<sup>3</sup> (Name, Email, Phone No.): FHWA, Donnie Brew, <u>Donnie.brew@dot.gov</u>, 919-747-7017

Project Name: Honey Mill Mitigation Site

Project Location (include coordinates if known): 36°25'47.3"N 80°36'38.3"W

Basic Project Description (provide narrative below or attach additional information):

The Honey Mill Mitigation Site is a stream mitigation project located in Surry County, approximately 5 miles south of Mount Airy and 7 miles northeast of Dobson. The project will include restoration and enhancement of Venable Creek and multiple unnamed tributaries which flow to the Ararat River for a total of 5,344 cold stream credits. Historically the site has been used for agriculture. The site is currently used primarily for open and forested cattle pasture. Cattle have full access to all site streams resulting in extensive erosion and incision. The project will provide stream mitigation units to the Division of

<sup>&</sup>lt;sup>1</sup> http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

<sup>&</sup>lt;sup>2</sup> See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html

<sup>&</sup>lt;sup>3</sup> If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

Mitigation Services in the Yadkin River Basin (03040101). Construction of the stream restoration project will include some tree removal (>3"DBH) – approximately 4.2 acres.

| General Project Information                                                       | YES | NO          |  |
|-----------------------------------------------------------------------------------|-----|-------------|--|
| Does the project occur within 0.25 miles of a known hibernaculum?                 |     | $\boxtimes$ |  |
| Does the project occur within 150 feet of a known maternity roost tree?           |     |             |  |
| Does the project include forest conversion4? (if yes, report acreage below)       |     |             |  |
| Estimated total acres of forest conversion                                        | 4.2 | 4.2 ac      |  |
| If known, estimated acres5 of forest conversion from April 1 to October 31        | 4.2 | ac          |  |
| If known, estimated acres of forest conversion from June 1 to July 316            |     | 1.1         |  |
| Does the project include timber harvest? (if yes, report acreage below)           |     |             |  |
| Estimated total acres of timber harvest                                           |     | N           |  |
| If known, estimated acres of timber harvest from April 1 to October 31            |     |             |  |
| If known, estimated acres of timber harvest from June 1 to July 31                |     |             |  |
| Does the project include prescribed fire? (if yes, report acreage below)          |     | $\boxtimes$ |  |
| Estimated total acres of prescribed fire                                          |     |             |  |
| If known, estimated acres of prescribed fire from April 1 to October 31           |     |             |  |
| If known, estimated acres of prescribed fire from June 1 to July 31               |     |             |  |
| Does the project install new wind turbines? (if yes, report capacity in MW below) |     | $\boxtimes$ |  |
| Estimated wind capacity (MW)                                                      |     |             |  |

### Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

1 Pres Signature:

Date Submitted: 9-20-18

<sup>&</sup>lt;sup>4</sup> Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).

<sup>&</sup>lt;sup>5</sup> If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.

<sup>&</sup>lt;sup>b</sup> If the activity includes tree clearing in June and July, also include those acreage in April to October.

#### U.S. Department of Agriculture

# FARMLAND CONVERSION IMPACT RATING

| PART I (To be completed by Federal Agency)                                                                                                              |                       |                   | Date Of Land Evaluation Request 7/31/18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |                     |              |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|--------------|--|--|
| Name Of Project Honey Mill Mitigation Site                                                                                                              |                       |                   | Federal Agency Involved Federal Highway Administration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                     |              |  |  |
| Proposed Land Use Stream Restoration                                                                                                                    |                       |                   | County And State Surry County, North Carolina                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                         |                     |              |  |  |
| PART II (To be completed by NRCS)                                                                                                                       |                       |                   | Date Request Received By NRCS 9/19/18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |              |  |  |
| Does the site contain prime, unique, statewide or local important farm (If no, the FPPA does not apply do not complete additional parts c               |                       |                   | Iland?     Yes     No     Acres Irrigated     Average Farm Size       of this form).     Image: Content of this form in the second seco |                         |                     |              |  |  |
| Major Crop(s)<br>CORN<br>Farmable Land In Govt. J<br>Acres: 187.236 acr                                                                                 |                       | ovt. Jurisdiction | JurisdictionAmount Of Farmland As Defined in FFres% 54Acres: 155,337 acres                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                         | ned in FPPA<br>% 45 |              |  |  |
| Name Of Land Evaluation System Used         Name Of Local Site Assessmer           Surry County, NC LESA         N/A                                    |                       |                   | System Date Land Evaluation Returned By NRCS October 18, 2018 by eMail                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                     |              |  |  |
| PART III (To be completed by Federal Agency)                                                                                                            |                       |                   | Site A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Alternative Site Rating |                     |              |  |  |
| A. Total Acres To Be Converted Directly                                                                                                                 |                       |                   | 17.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sile D                  | Sile C              | Sile D       |  |  |
| B. Total Acres To Be Converted Indirectly                                                                                                               |                       |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                     |              |  |  |
| C. Total Acres In Site                                                                                                                                  |                       |                   | 17.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 0.0                     | 0.0                 | 0.0          |  |  |
| PART IV (To be completed by NRCS) Land Evalu                                                                                                            | uation Information    |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                     |              |  |  |
| A. Total Acres Prime And Unique Farmland                                                                                                                |                       |                   | 6.58                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                     |              |  |  |
| B. Total Acres Statewide And Local Important                                                                                                            | Farmland              |                   | 2.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                     |              |  |  |
| C. Percentage Of Farmland In County Or Loca                                                                                                             | I Govt. Unit To Be C  | Converted         | 0.0061                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                         |                     |              |  |  |
| D. Percentage Of Farmland In Govt. Jurisdiction Wit                                                                                                     | n Same Or Higher Rela | ative Value       | 41.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                         |                     |              |  |  |
| <b>PART V</b> ( <i>To be completed by NRCS</i> ) Land Evaluation Criterion<br>Relative Value Of Farmland To Be Converted ( <i>Scale of 0 to 100 I</i> ) |                       |                   | 44                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                       | 0                   | 0            |  |  |
| <b>PART VI</b> (To be completed by Federal Agency)<br>Site Assessment Criteria (These criteria are explained in 2)                                      | 7 CFR 658.5(b)        | Maximum<br>Points |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                     |              |  |  |
| 1. Area In Nonurban Use                                                                                                                                 |                       | 15                | 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |              |  |  |
| 2. Perimeter In Nonurban Use                                                                                                                            |                       | 10                | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |              |  |  |
| 3. Percent Of Site Being Farmed                                                                                                                         |                       | 20                | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |              |  |  |
| 4. Protection Provided By State And Local Go                                                                                                            | vernment              | 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                | 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |              |  |  |
| 8. Creation Of Nonfarmable Farmland                                                                                                                     |                       | 10                | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                     |              |  |  |
| 9. Availability Of Farm Support Services                                                                                                                | 5                     | 5                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                     |              |  |  |
| 10. On-Farm Investments                                                                                                                                 | m dia a a             | 20                | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                     |              |  |  |
| 11. Effects Of Conversion On Farm Support Se                                                                                                            | rvices                | 10                | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                     |              |  |  |
| 12. Compatibility with Existing Agricultural Use                                                                                                        |                       |                   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                         |                     |              |  |  |
| TOTAL SITE ASSESSMENT POINTS                                                                                                                            |                       |                   | 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                       | 0                   | 0            |  |  |
| PART VII (To be completed by Federal Agency)                                                                                                            |                       |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                         |                     |              |  |  |
| Relative Value Of Farmland (From Part V)                                                                                                                |                       | 100               | 44                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                       | 0                   | 0            |  |  |
| Total Site Assessment (From Part VI above or a local<br>site assessment)                                                                                |                       | 160               | 95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 0                       | 0                   | 0            |  |  |
| TOTAL POINTS (Total of above 2 lines)                                                                                                                   |                       | 260               | 139                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0                       | 0                   | 0            |  |  |
| Site Selected:                                                                                                                                          | Date Of Selection     |                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Was A Local S<br>Ye     | ite Assessment U    | sed?<br>No 🔲 |  |  |

Reason For Selection:

Good Morning,

Attached is the completed Farmland Conversion Impact Evaluation form for the Honey Mill Mitigation Site for your records.

Thank you for your assistance,

Tasha King | Environmental Scientist0: 919.851.9986 x116

### Wildlands Engineering, Inc.

312 W. Millbrook Rd, Suite 225 Raleigh, NC 27609

From: Cortes, Milton - NRCS, Raleigh, NC <Milton.Cortes@nc.usda.gov>
Sent: Thursday, October 18, 2018 4:11 PM
To: Tasha King <tking@wildlandseng.com>
Subject: RE: Honey Mill Mitigation Site - Surry County, NC - AD1006 Form Request Importance: High

Tasha:

Please find attached the Farmland Conversion Impact rating evaluation for the Honey Mill Mitigation Site in Surry Co., NC.

I saw in your 09/19/2018 email that you sent one back in July. Looks like got lost in the system since the last one I have from you is in July 20, 2018 for the Double H Farm. I apologize for any inconvenience but sometimes happens. I've been telling our customer to double check with me, at least, a week after the first email has been sent since it is not the first time it happens.

If I can be of further assistance please let me know.

Have a great evening!!

Milton Cortes Acting State Soil Scientist Natural Resources Conservation Service 4407 Bland Rd, Suite 117 Raleigh, NC 27609 From: Tasha King [mailto:tking@wildlandseng.com]
Sent: Thursday, October 18, 2018 3:13 PM
To: Cortes, Milton - NRCS, Raleigh, NC <<u>Milton.Cortes@nc.usda.gov</u>>
Subject: Honey Mill Mitigation Site - Surry County, NC - AD1006 Form Request

Good Afternoon,

Thank you very much for your help on this! I just pasted in my previous email below with the information on Honey Mill Mitigation Site and I'll reattach the forms and maps. I didn't want to just forward the email just in case there was something wrong with the chain and what's why you didn't get it before. Please let me know if you need anything else!

Thank you, Tasha

From: Tasha King
Sent: Tuesday, July 31, 2018 8:38 AM
To: Cortes, Milton - NRCS, Raleigh, NC <<u>Milton.Cortes@nc.usda.gov</u>>
Subject: Request for AD1006 Form - Honey Mill Mitigation Site - Surry County, NC

Good Morning,

I have a request for a completed AD-1006 form for an NCDENR Division of Mitigation Services (DMS) stream restoration project (Honey Mill Mitigation Site) located in Surry County. The project site is located at latitude 36.429798, longitude -80.610641. I have attached the AD-1006 form with Parts I and III filled out, as well as a site and soil map. The soil map includes a soil breakdown. Please let me know if you need any additional information.

Thank you for your time and assistance,

Tasha KingEnvironmental Scientist704.332.7754

Wildlands Engineering, Inc. 1430 S. Mint St, Suite 104 Charlotte, NC 28203



July 30, 2018

Shannon Deaton North Carolina Wildlife Resource Commission Division of Inland Fisheries 1721 Mail Service Center Raleigh, NC 27699

Subject: Honey Mill Mitigation Site Surry County, North Carolina

Dear Ms. Deaton,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with the proposed Honey Mill Mitigation Site, a stream mitigation site located in Surry County, NC. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Mount Airy South, 7.5-Minute USGS Topographic Quadrangle, and the site is located at latitude 36.429798, longitude -80.610641.

The Honey Mill Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel impacts. This project will include stream restoration and enhancement of Venable Creek and seven unnamed tributaries, which all flow to Ararat River. Several sections of channel have been identified as significantly degraded, primarily due to its use as cattle pasture. Cattle have full access to the streams which has resulted in extensive erosion and incision.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning this project.

Sincerely,

TAX

Tasha King Environmental Scientist

<u>Attachment</u>: Figure 1 Site Map Figure 2 USGS Topographic Map





# ➢ North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

August 8, 2018

Tasha King Wildlands Engineering 1430 S. Mint Street, Suite 104 Charlotte, NC 28203

SUBJECT: Honey Mill Mitigation Site

Dear Ms. King:

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) received your July 30, 2018 letter regarding plans for a stream restoration project on unnamed tributaries to the Ararat River in Surry County. You requested review and comment on any possible issues that might emerge with respect to fish and wildlife associated with the project. Our comments on this project are offered for your consideration under provisions of the Clean Water Act of 1977 (33 U.S.C. 466 et. seq.) and Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Details were not provided in the letter on design nor the size of the project. The project is proposed as a mitigation project and will involve stream enhancement and restoration.

This project should not impact wild trout resources. We recommend that riparian buffers that are to be reestablished be as wide as possible, given site constraints and landowner needs. NCWRC generally recommends a woody buffer of 100 feet on perennial streams to maximize the benefits of buffers, including bank stability, stream shading, treatment of overland runoff, and wildlife habitat.

Thank you for the opportunity to review and comment on this project. Please contact me at (828) 803-6054 if you have any questions about these comments.

Sincerely,

Indrea delescie

Andrea Leslie Mountain Region Coordinator Habitat Conservation Program

Honey Mill Mitigation Site Categorical Exclusion FIGURES





| 0 |   | 400 |   | 80 |  |  |
|---|---|-----|---|----|--|--|
| 1 | 1 | 1   | 1 |    |  |  |

00 Feet

Figure 1 Site Map Honey Mill Mitigation Site Yadkin River Basin (03040101)





0 400 800 Feet

Figure 2 USGS Topographic Map Honey Mill Mitigation Site Yadkin River Basin (03040101)





0 400 Т 

800 Feet

ſN

Figure 3 Soils Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

### **APPENDIX 6 – IRT Communications**


## **MEETING NOTES**

| MEETING:  | IRT Site Walk                     |
|-----------|-----------------------------------|
|           | HONEY MILL Mitigation Site        |
|           | Yadkin 03040101; Surry County, NC |
|           | DEQ Contract No. 7619             |
|           | DMS Project No. 100083            |
|           | Wildlands Project No. 005-02178   |
| DATE:     | Tuesday, September 25, 2018       |
| LOCATION: | Little Mountain Church Road       |
|           | Mt. Airy, NC                      |
|           |                                   |

### Attendees

Todd Tugwell, USACE Andrea Leslie, USFWS Mac Haupt, DWR Paul Wiesner, DMS Kelly Phillips, DMS Kirsten Ullman, DMS Periann Russell, DMS Shawn Wilkerson, Wildlands Aaron Earley, Wildlands

## Materials

• Wildlands Engineering Honey Mill Mitigation Site Technical Proposal dated March 28, 2018 (in response to RFP #16-007406)

## **Meeting Notes**

The meeting began at 9:00 AM. Shawn presented an overview of the Honey Mill Mitigation Site (Site) at the parking location. From there, the group proceeded to walk the entire site in the following general order: UT1, Venable Creek Reach 1, UT2A, UT2, UT3, UT4, Venable Creek Reach 2, UT5, and UT6. Detailed meeting minutes, organized by stream reach, are presented on the following pages.

While IRT members agreed that the Site is suitable to provide compensatory stream mitigation and that stream treatment(s) seemed appropriate, adjustments to credit ratios are expected. The IRT provided feedback regarding credit ratios on the enhancement II reaches and these ratios are included in this memo. Wildlands and DMS understand that final design approaches and crediting rationale must be fully justified in the mitigation plan.

The meeting concluded at 12:00 PM.

## 1. UT1 - Restoration

- UT1 will be restored, beginning at a culvert under Siloam Road and continuing to the confluence with Venable Creek. Restoration will connect the channel to its floodplain.
- The group agreed that restoration is appropriate given the lack of pattern and bedform diversity and erosion along the left bank.

## 2. Venable Creek Reach 1 - Restoration

- Todd and Mac noted that the section between the Little Mountain Church Road culvert and the UT1 confluence looked geomorphically stable and fits better within an E-II approach. Wildlands agreed to change this section to E-II.
- The channel begins to become incised downstream of the UT1 confluence. Todd and Paul discussed the possibility of a 50' 100' E-I transition section before restoration.
- The group agreed that the next section was most likely dug out along the left valley wall and spoil cast into the middle of the valley. The group noticed the low point of the valley closer to the right valley wall and Shawn said the new stream would try to follow the low point where feasible.
   Periann suggested that the historic low point be pointed out and addressed in the mitigation plan.
- The banks along the lower section of Reach 1 become lower as its flows along a fence line. Multiple cattle wallow areas have impacted the banks in this section.
- Mac and Todd remarked that the need for widespread restoration was not obvious on Reach 1.
   Shawn noted that achieving priority 1 restoration is important and the transitioning back and forth between restoration and incised E-II would not be feasible.
- Ultimately, the IRT agreed that restoration is valid from a point downstream of UT1 confluence to the confluence with UT3 with a small transition of E1. (see figure).

## 3. UT2A – Enhancement II

- This reach will be fenced to exclude cattle. Cattle trails parallel the stream channel to the upstream fence line.
- Todd questioned the validity of a 3:1 ratio given the presence of an existing wooded buffer. He said that 2.5:1 is typically allowed for livestock exclusion and buffer restoration. Reference was made to ongoing discussions between IRT, DMS, and providers about establishing guidelines for E-II ratios that account for degree of cattle impact and presence of buffer. This point was discussed for most of the reaches throughout the site.
- Shawn compared the absence of understory within the project limits and the full understory upstream of the project where there are no cows. Todd mentioned that if understory buffer restoration is claimed, then performance criteria for survival should be set.
- $\circ~$  Todd and Andrea remarked that this reach was closer to a 5:1 ratio.
- $\circ~$  Ultimately, the decision was made that 4:1 would be the ratio for this reach.

## 4. UT2

## • Reach 1 – Enhancement II

 $\circ~$  This reach flows through a wooded buffer similar to UT2A. Cattle will be fenced out of this reach.

- Andrea remarked that supplemental planning would be beneficial between the woodline and the confluence with UT2A.
- $\circ~$  Ultimately, the decision was made that 4:1 would be the ratio for this reach.

## • Reach 2 - Restoration

- The downstream section of UT2 has been heavily impacted by cattle. A new channel has formed to flow around the cattle wallow area. A channel will be restored through this area.
- Todd and Mac noted that the cattle wallow area looked like a wetland and to be cautious when designing a channel through it.
- $\circ~$  The barn adjacent to the existing channel will be removed.

## 5. UT3 – Enhancement II

## • Reach 1 – Enhancement II

- Cattle will be fenced out and a BMP will be installed at the upstream end. Some minor channel work will also be needed at the upstream end.
- o Shawn noted how widespread cattle impact was much more obvious during previous site visits.
- Mac said that the middle section of the reach looked stable and thought a 3:1 to 4:1 ratio was valid.
- Shawn reiterated that sections of stable areas were combined with sections requiring more work to develop reach-wide ratios.
- $\circ~$  Ultimately, the decision was made that 3:1 would be the ratio for this reach.

## • Reach 2 – Restoration

 The group agreed that restoration is warranted for the downstream reach of UT3. Moving the channel back into the middle of the valley and connecting to a restored Venable Creek is acceptable.

## 6. UT4 – Enhancement II

- This reach consists of cattle exclusion, spot bank stabilization, and a BMP at the upstream end to stabilize the transition. A short section of channel work will be done at the downstream tie in with Venable Creek.
- $\circ$   $\,$  Todd noted that this reach exhibited the most cattle impact so far.
- Todd asked about the extent of planting. Shawn answered that planting will occur only where the existing buffer is impacted for spot bank stabilization activities. Todd mentioned that it would be helpful to show the spot bank treatment locations on a map.
- Ultimately, the decision was made that 3:1 would be the ratio for this reach.

## 7. Venable Creek Reach 2 – Enhancement II

 While there is minimal cattle impact and erosion on the upstream section of this reach, the channel becomes more incised and instable as you walk downstream. Cattle will be excluded from the entire reach and bank and bench grading will be implemented on the downstream section.



- Todd questioned if it would be better to break the reach into shorter sections based on proposed approaches as opposed to lumping it all together.
- $\circ~$  Ultimately, the decision was made that 2.5:1 would be the ratio for this reach.

## 8. UT5 – Enhancement II

- A cattle wallow area has diverted flow from the old channel and has formed a new channel. Cattle will be excluded from this reach and the flow will be re-established into the old channel. The group agree that this is the best approach.
- $\circ~$  Ultimately, the decision was made that 3:1 would be the ratio for this reach.

## 9. UT6

## • Reach 1 – Enhancement II

- This reach begins at an eroded seep upstream and flows through a narrow valley. Cattle will be excluded and spot channel stabilization will be implemented along this reach. A BMP will be installed at the upstream end to stabilize the eroded seep.
- $\circ~$  Ultimately, the decision was made that 3:1 would be the ratio for this reach.
- Reach 2 Restoration
  - Cattle impact has diverted stream flow away from the old channel. The stream now flows down a cattle trail all the way to Venable Creek. This section will be restored to flow down the natural valley.
  - The group agreed with this approach.

## Attached is a figure that updates approaches and ratios.

These meeting minutes were prepared by Aaron Earley October 8, 2018 and reviewed by Shawn Wilkerson on October 8, 2018 and represent the authors' interpretation of events.



|                          | Stream Credits                                                                                                                                                                                         |                |                               |       |                   |  |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------------|-------|-------------------|--|
| Reach                    | Management Objectives Type of Mitigation                                                                                                                                                               |                | Length<br>(feet) <sup>1</sup> | Ratio | Stream<br>Credits |  |
| RESTORATION              |                                                                                                                                                                                                        |                |                               |       |                   |  |
| Venable Creek<br>Reach 3 | Restore appropriate dimension, pattern, and profile with Priority<br>1 restoration. Install habitat structures, allow bankfull floodplain<br>access. Establish native riparian buffer, exclude cattle. | Restoration    | 1,687                         | 1:1   | 1,687             |  |
| UT1                      | Restore appropriate dimension, pattern, and profile with Priority<br>1 restoration. Install habitat structures, allow bankfull floodplain<br>access. Establish native riparian buffer, exclude cattle. | Restoration    | 211                           | 1:1   | 211               |  |
| UT2 Reach 2              | Restore appropriate dimension, pattern, and profile with Priority<br>1 restoration. Install habitat structures, allow bankfull floodplain<br>access. Establish native riparian buffer, exclude cattle. | Restoration    | 203                           | 1:1   | 203               |  |
| UT3 Reach 2              | Restore appropriate dimension, pattern, and profile with Priority<br>1 restoration. Install habitat structures, allow bankfull floodplain<br>access. Establish native riparian buffer, exclude cattle. | Restoration    | 395                           | 1:1   | 395               |  |
| UT6<br>Reach 2           | Restore appropriate dimension, pattern, and profile with Priority<br>1 restoration. Install habitat structures, allow bankfull floodplain<br>access. Establish native riparian buffer, exclude cattle. | Restoration    | 324                           | 1:1   | 324               |  |
|                          | Restoration Subtota                                                                                                                                                                                    |                |                               |       |                   |  |
|                          | ENHANCEMENT                                                                                                                                                                                            | •              |                               |       |                   |  |
| Venable Creek<br>Reach 1 | Exclude cattle, plant the riparian buffer. Treat invasives.                                                                                                                                            | Enhancement II | 150                           | 2.5:1 | 60                |  |
| Venable Creek<br>Reach 2 | Excavate floodplain bench, install in-stream structures, transition to priority 1 downstream. Exclude cattle, plant the riparian buffer.<br>Treat invasives.                                           | Enhancement I  | 150                           | 1.5:1 | 100               |  |
| Venable Creek<br>Reach 4 | Spot repair erosion and incision, exclude cattle. Treat invasives.                                                                                                                                     | Enhancement II | 1,907                         | 2.5:1 | 763               |  |
| UT2 Reach 1              | Spot repair erosion and incision, exclude cattle. Treat invasives.                                                                                                                                     | Enhancement II | 870                           | 4:1   | 217               |  |
| UT2A                     | Spot repair erosion and incision, exclude cattle. Treat invasives.                                                                                                                                     | Enhancement II | 935                           | 4:1   | 234               |  |
| UT3 Reach 1              | Spot repair erosion and incision, exclude cattle, plant the riparian buffer. Treat invasives.                                                                                                          | Enhancement II | 813                           | 3:1   | 271               |  |
| UT4                      | Spot repair erosion and incision, exclude cattle. Treat invasives.                                                                                                                                     | Enhancement II | 438                           | 3:1   | 146               |  |
| UT5                      | Spot repair erosion and incision, exclude cattle, plant the riparian buffer. Treat invasives.                                                                                                          | Enhancement II | 353                           | 3:1   | 118               |  |
| UT6 Reach 1              | Spot repair erosion and incision, exclude cattle, plant the riparian buffer. Treat invasives.                                                                                                          | Enhancement II | 296                           | 3:1   | 99                |  |
| Enhancement II Subtotal  |                                                                                                                                                                                                        | 5,912          |                               | 2,008 |                   |  |
|                          |                                                                                                                                                                                                        |                |                               |       | 4,828 Cool        |  |
|                          |                                                                                                                                                                                                        | Project Total  | 8,832 LF                      |       | Stream<br>Credits |  |

## Stream Credits Proposed for the Honey Mill Mitigation Site: REVISED October 9, 2018







| 0 | 150 | 300 | 600 Feet |
|---|-----|-----|----------|
|   |     |     |          |

Figure 6 Concept Map Honey Mill Mitigation Site Yadkin River Basin (03040101)

Н

Surry County, NC

APPENDIX 7 – Invasive Species Treatment Plan

# Appendix 7 Invasive Species Treatment Plan

Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. These site inspections may identify the presence of invasive vegetation. If, during the monitoring period, invasive species threaten the survivability of planted woody vegetation in an area that exceeds 1% of the planted easement acreage, the invasive species shall be treated. Smaller areas may be treated at the discretion of the project engineer and biologist, if deemed in the best interest of the Site. Generally, the treatment plan shall follow the below guidelines in Table 1 for common invasive species found in riparian areas; however, the treatment may be changed based on the professional judgement of the project engineer and biologist. For invasive species not listed in the below table that threaten the survivability of the planted woody vegetation, Wildlands shall notify DMS of the invasive species observed and the plan for treatment prior to treating the species. All invasive species treatment will be reported in the following year's monitoring plan.

| Invasive Species                                         | Recommended Removal Technique                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Multiflora Rose<br>(Rosa multiflora)                     | Foliar treatment of large populations with 4% glyphosate solution. Cut stump treatment is time consuming, though effective. Treat in spring/summer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Autumn Olive<br>(Elaeagnus<br>umbellate)                 | Cut stump treatment with glyphosate (Aquaneat or other) is effective at controlling larger individuals. Use 20% solution with non-ionic surfactant sprayed on stump with squirt bottle immediately after cutting. Hack and squirt treatment is also effective using triclopyr (Garlon 3A) at 5% solution. Use notched hatchet blade to create pocket for herbicide in cambium layer. Basal bark treatment is an option. Basal bark is quicker treatment option for large populations but usually +/- 50% efficacy and requires further treatment from resprouts.                                                                                                                                                                                                                                |
| Japanese<br>Barberry<br>( <i>Berberis</i><br>thunbergii) | Cut stump of larger individuals with 25-50% glyphosate solution (Aquaneat or other) with<br>non-ionic surfactant. Apply using paint brush immediately after cutting stump. Bag all<br>above ground material containing viable seeds and remove from site. Can also use<br>triclopyr (Garlon 3A or Garlon 4) in 25-50% solution. Apply using shoe polish bottle or<br>spray bottle immediately after cutting stump. Larger populations of immature individuals<br>use backpack sprayer with above concentrations of either chemical. Birds will readily<br>disperse seeds from mature bushes. Populations dynamics demand control of seed<br>bearing individuals to limit spread. Quite thorny and rampant. Naturalized in WNC<br>mountainous areas around Watauga. Ashe and Alleghany counties. |
| Honeysuckle<br>(Lonicera<br>japonica)                    | Small infestations of <i>L. japonica</i> can be pulled by hand. Monitor to remove any re-sprouts.<br>Care should be taken to bag and remove the plants, including mature fruits to prevent re-<br>establishment. Large infestations of <i>L. japonica</i> will usually require a combination of cut<br>stump and foliar herbicide treatments. Where vines have grown into the tree canopy, cut<br>each stem as close to the ground as possible. Treat the freshly cut surface of the rooted<br>stem with a 25 percent solution of glyphosate or triclopyr. Groundcovers of <i>L. japonica</i> can<br>be treated with a foliar solution of 2 percent glyphosate or triclopyr plus a 0.5 percent non-<br>ionic surfactant to thoroughly wet all the leaves.                                       |
| Chinese Privet<br>( <i>Ligustrum</i><br><i>sinense</i> ) | Wet leaves with one of the following herbicides in water with a surfactant: a glyphosate herbicide as a 3-percent solution (12 ounces per 3-gallon mix) in the late fall or early winter when safety to surrounding vegetation is desired, or elsewhere, Arsenal AC* as a 1-percent solution (4 ounces per 3-gallon mix). Backpack mist blowers can broadcast glyphosate as a 3-percent solution (12 ounces per 3-gallon mix) or Escort XP* at 1 ounce per acre (0.2 dry ounces per 3-gallon mix and 10 gallons per acre) during winter for safety to dormant hardwoods. Summer applications of glyphosate may not be as effective as other times and                                                                                                                                           |

| Table 1. Invasive Species | s Treatment – Honey Mill Mitigo | ation Site |
|---------------------------|---------------------------------|------------|
|---------------------------|---------------------------------|------------|

| Invasive Species                     | Recommended Removal Technique                                                                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | require a higher percent solution. The best time for Arsenal AC* and Escort XP* is summer                                                                                                   |
|                                      | to fall. For stems too tall for foliar sprays and when safety to surrounding vegetation is                                                                                                  |
|                                      | desired, apply a basal spray of Garlon 4 as a 20-percent solution (5 pints per 3-gallon mix)                                                                                                |
|                                      | in a labeled basal oil product, vegetable oil or mineral oil with a penetrant, or fuel oil or                                                                                               |
|                                      | diesel fuel (where permitted); or undiluted Pathfinder II. Elsewhere, apply Stalker* as a 6-                                                                                                |
|                                      | to 9-percent solution (1.5 to 2 pints per 3-gallon mix) in a labeled basal oil product,                                                                                                     |
|                                      | vegetable oil or mineral oil with a penetrant, or fuel oil or diesel fuel (where permitted) to                                                                                              |
|                                      | young bark as a basal spray making certain to treat all stems in a clump; or cut and                                                                                                        |
|                                      | immediately treat the stump tops with Arsenal AC* as a 5-percent solution (20 ounces per                                                                                                    |
|                                      | 3-gallon mix) or Velpar L* as a 10-percent solution in water (1 quart per 3-gallon mix) with                                                                                                |
|                                      | a surfactant. When safety to surrounding vegetation is desired, immediately treat stump                                                                                                     |
|                                      | tops and sides with Garlon 3A or with a glyphosate herbicide as a 20-percent solution (5                                                                                                    |
|                                      | pints per 3-gallon mix) in water with a surfactant. ORTHO Brush-B-Gon and Enforcer Brush                                                                                                    |
|                                      | Killer are effective undiluted for treating cut-stumps and available in retail garden stores                                                                                                |
|                                      | (safe to surrounding plants). For large stems, make stem injections using Arsenal AC* or                                                                                                    |
|                                      | when safety to surrounding vegetation is desired, Garlon 3A or a glyphosate herbicide                                                                                                       |
|                                      | using dilutions and cut-spacings specified on the herbicide label (anytime except March                                                                                                     |
|                                      | and April). An EZ-Ject tree injector can help to reach the lower part of the main stem;                                                                                                     |
|                                      | otherwise, every branching trunk must be hack-and-squirt injected.                                                                                                                          |
|                                      | Small patches of <i>P. montand</i> that are not well-established can usually be eliminated by                                                                                               |
|                                      | persistent weeding, mowing, or grazing during the growing season. The spread of a well-                                                                                                     |
|                                      | established infestation of <i>P. montana</i> can be controlled the same way, but cutting will                                                                                               |
|                                      | typically not kill the roots of larger plants. For vines in tree canopies, cut the vines hear the ground and apply a 50 percent solution of triclopyr to the stumps. This procedure remains |
| Kudzu                                | effective at lower temperatures as long as the ground is not frozen. Large infectations can                                                                                                 |
| (Dueraria                            | he effectively controlled with a foliar solution of 2 to 3 percent glyphosate or triclopyr plus                                                                                             |
| (rucruna)                            | a $0.5$ percent pop-jonic surfactant to thoroughly wet all leaves. The amhient air                                                                                                          |
| montanaj                             | temperature should be above 65 degrees Fahrenheit. After the above ground vegetation is                                                                                                     |
|                                      | controlled and it is possible to dig and cut into the central root crown, apply a 50 percent                                                                                                |
|                                      | solution of glyphosate or triclopyr to the wound. The most successful chemical control of P.                                                                                                |
|                                      | montana can be achieved with a foliar solution of 0.75 percent clopyralid plus a 0.5 percent                                                                                                |
|                                      | non-ionic surfactant. Monitor all treatments in subsequent years for re-sprouting.                                                                                                          |
|                                      | The most effective chemical control of <i>A. brevipedunculata</i> has been achieved using                                                                                                   |
|                                      | triclopyr formulations toward the end of the growing season when plants are transporting                                                                                                    |
|                                      | nutrients to their roots. Apply a 2 percent solution of triclopyr plus a 0.5 percent non-ionic                                                                                              |
| Porcelain berry                      | surfactant to the foliage. Or cut the plants first, allow time for re-growth, and then apply                                                                                                |
| (Ampeiopsis                          | the herbicide mixture. A. brevipedunculata can also be killed with a mixture of 25 percent                                                                                                  |
| gianaulosa var.<br>brovinodunovlata) | triclopyr and 75 percent mineral oil applied to the basal parts of the stem to a height of 2                                                                                                |
| previpedunculutu)                    | to 3 feet from the ground. This method should be used judiciously since it takes a lot of                                                                                                   |
|                                      | chemical and can result in overspray. It has been used successfully in situations where no                                                                                                  |
|                                      | other technique is feasible, such as cliff faces or other exposed sites.                                                                                                                    |
|                                      | Pre-emergent herbicide containing sulfometuron methyl (Oust XP) applied in early spring                                                                                                     |
|                                      | causes minimal damage to established perennial vegetation. Mechanical control by cutting                                                                                                    |
|                                      | or mowing as close to the ground as possible beginning in late spring and recurring                                                                                                         |
| Japanese Hops                        | frequently until fall dieback is recommended. Post emergent herbicide treatment two                                                                                                         |
| (Humulus                             | times a year (mid and late summer) to prevent the fall seed set is recommended.                                                                                                             |
| japonicus)                           | Glyphosate provides good post-emergent chemical control. Hop seeds in the soil last up to                                                                                                   |
|                                      | three years. Repeat treatments for two to three years should be expected, or longer in                                                                                                      |
|                                      | areas subject to flooding that may receive influx of seeds from upstream infestations.                                                                                                      |
|                                      | Cultural control methods which favor fast-growing tall tree species to create dense shade                                                                                                   |



| Invasive Species                          | Recommended Removal Technique                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | in spring and summer and canopy closure will discourage infestations, as Japanese hop                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                           | prefers direct sunlight and does not tolerate heavy shade.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Johnson Grass<br>(Sorghum<br>halepense)   | <ul> <li>Recommended control procedures:</li> <li>Thoroughly wet all leaves with one of the following herbicides in water with a surfactant (June to October with multiple applications applied to regrowth).</li> <li>Recommendation for mature grass control: apply Outrider* as a broadcast spray at 0.75 to 2 ounces per acre (0.2 to 0.6 dry ounce per 3-gallon mix) plus a nonionic surfactant to actively growing Johnsongrass. For handheld and high-volume sprayers, apply 1 ounce of Outrider per 100 gallons of water plus a nonionic surfactant at 0.25 percent. Outrider is a selective herbicide that can be applied over the top of certain other grasses to kill Johnsongrass, or apply Plateau as a 0.25-percent solution (1 ounce per 3-gallon mix) when plants are 18 to 24 inches (45 to 60 cm) tall or larger.</li> <li>Recommendation for seedling control: apply Journey as a 0.3-percent solution (1.2 ounces per 3-gallon mix) before Johnsongrass sprouts and when desirable species are dormant or apply a glyphosate herbicide as a 2-percent solution (8 ounces per 3-gallon mix) directed at the infestation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Mimosa<br>( <i>Albizia julibrissin)</i>   | Trees: Make stem injections using Arsenal AC* or when safety to surrounding vegetation is desired, Garlon 3A or Milestone in dilutions as specified on the herbicide label (anytime except March and April). For felled trees, apply the herbicides to stump tops immediately after cutting. ORTHO Brush-B-Gon and Enforcer Brush Killer are effective undiluted for treating cut-stumps and available in retail garden stores (safe to surrounding plants). Saplings: Apply a basal spray to young bark using Garlon 4 as a 20-percent solution (5 pints per 3-gallon mix) in a labeled basal oil product, vegetable oil or mineral oil with a penetrant, or fuel oil or diesel fuel (where permitted); or undiluted Pathfinder II. Elsewhere, apply Stalker* as a 6- to 9-percent solution (1.5 to 2 pints per 3-gallon mix) in a labeled basal oil product, vegetable oil, kerosene, or diesel fuel (where permitted). Resprouts and seedlings: Thoroughly wet all leaves with one of the following herbicides in water with a surfactant: From June to August, either Escort XP at 1 ounce per acre (0.2 ounces per 3-gallon mix) or Milestone VM Plus at 6 to 9 pints per acre (1.5 to 3 pints per 3-gallon mix and 10 gallons per acre). From July to September, Transline* † or Milestone as a 0.25-percent solution plus Garlon 3A as a 4-percent solution (1 ounce plus 5 ounces per 3-gallon mix).                                                                                                                                                                  |
| Princess Tree<br>(Paulownia<br>tomentosa) | <ul> <li>Foliar Spray Method: This method should be considered for large thickets of paulownia seedlings where risk to non-target species is minimal. Air temperature should be above 65ŰF to ensure absorption of herbicides.</li> <li>Glyphosate: Apply a 2% solution of glyphosate and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Glyphosate is a non-selective systemic herbicide that may kill non-target partially-sprayed plants.</li> <li>Triclopyr: Apply a 2% solution of triclopyr and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Glyphosate is a non-selective systemic herbicide that may kill non-target partially-sprayed plants.</li> <li>Triclopyr: Apply a 2% solution of triclopyr and water plus a 0.5% non-ionic surfactant to thoroughly wet all leaves. Use a low pressure and coarse spray pattern to reduce spray drift damage to non-target species. Triclopyr is a selective herbicide for broadleaf species. In areas where desirable grasses are growing under or around paulownia, triclopyr can be used without non-target damage.</li> <li><u>Cut Stump Method</u>: This control method should be considered when treating individual trees or where the presence of desirable species precludes foliar application. Stump treatments can be used if the ground is not frozen.</li> </ul> |



| Invasive Species | Recommended Removal Technique                                                               |
|------------------|---------------------------------------------------------------------------------------------|
|                  | Glyphosate: Horizontally cut stems at or near ground level. Immediately apply a 25%         |
|                  | solution of glyphosate and water to the cut stump making sure to cover the outer 50% of     |
|                  | the stump.                                                                                  |
|                  | Triclopyr: Horizontally cut stems at or near ground level. Immediately apply a 50% solution |
|                  | of triclopyr and water to the cut stump making sure to cover the outer 20% of the stump.    |
|                  | https://www.se-eppc.org/manual/princess.html                                                |



**APPENDIX 8 – Site Protection Instrument** 

## Appendix 8 Site Protection Instrument

The land required for construction, management, and stewardship of this mitigation project includes portions of the parcels listed in Table 1. A State of North Carolina held conservation easement has been recorded on the Venable and Browne parcels to encompass the streams and wetlands being restored, enhanced, and preserved along with their corresponding buffers.

| Table 1: Site Protection Instrument – Ho | oney Mill Mitigation Site |
|------------------------------------------|---------------------------|
|------------------------------------------|---------------------------|

| Property Owner                                 | Parcel ID Number              | County | Under Option to<br>Purchase by<br>Wildlands? | Conservation Easement Deed<br>Book (DB) and Page Number<br>(PG) | Acreage<br>Protected |
|------------------------------------------------|-------------------------------|--------|----------------------------------------------|-----------------------------------------------------------------|----------------------|
| Monty K. Venable et. al.                       | 592800605518,<br>592700684669 | Surry  | Yes                                          | DB: 1714 PG: 997-1010                                           | 13.46                |
| LuAnn Venable Browne,<br>Charles Edward Browne | 5928599301                    | Surry  | Yes                                          | DB: 1714 PG: 859-871                                            | 6.86                 |



BK 1714 PG 997 - 1010 (14) DOC# 673773 This Document eRecorded: 11:42:04 AM 06/25/2020 Fee: \$26.00 Surry County, North Carolina Carolyn M. Comer, Register of Deeds **Received By: JENNIFER CROUSE** 

Tax: \$337.00

Excise Stamp \$337.00 STATE OF NORTH CAROLINA

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

SURRY COUNTY

SPO File Numbers: 86-BQ DMS Project Number: 100083

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 24<sup>th</sup> day of June, 2020, by Monty K. Venable as Executor of the Estate of Mary Lou Venable, pursuant to an enforceable written contract entered into by Mary Lou Venable prior to her death, ("Grantor"), whose mailing address is 140 Essex Lane, Mount Airy, NC 27030 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

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AG reviewed 11 May 2017

Submitted electronically by "Hiatt & Fawcett, PLLC" in compliance with North Carolina statutes governing recordable documents and the terms of the submitter agreement with the Surry County Register of Deeds.

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 7619.

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 8<sup>th</sup> 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 Eldora Township, Surry County, North Carolina (the "Property"), and being more particularly described as that certain parcels of land containing approximately 97.78 acres and being conveyed to the Grantor by deed as recorded in Deed Book 313, Page 722 and Deed Book 205, Page 495 of the Surry 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 Venable 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 A-1, A-2, and B containing a total of 13.462 acres as shown on the plats of survey entitled "Conservation Easement Survey for the State of North Carolina: Division of Mitigation Services, Honey Mill Mitigation Site, SPO File No. 86-BQ, DMS Site ID No. 100083", Property of Estate of Mary Lou Venable, Elisabeth Turner (License # L-4440) and recorded in the Surry County, North Carolina Register of Deeds at Plat Book 37, Page 160.

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.

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## 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.

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AG reviewed 11 May 2017

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**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: Division of Mitigation Services, Honey Mill Mitigation Site, SPO File No. 86-BQ, DMS Site ID No. 100083", Property of Mary Lou Venable Estate, (Elisabeth Turner, PLS #L-4440) and recorded in the Surry County, North Carolina Register of Deeds at Plat Book <u>37</u> Page <u>160</u> 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 subterraneous water flow.

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

**D.** Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict

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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

Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is A. 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:

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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.

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BK 1714 PG 1006

DOC# 673773

(SEAL)

Morty K. Venable, Executor of the Mary Lou Venable Estate pursuant to an enforceable written contract entered into by Mary Lou Venable prior to her death

NORTH CAROLINA COUNTY OF SURRY

I. Melinda C. Burnett , a Notary Public in and for the County and State aforesaid, do hereby certify that Monty K. Venable, Grantor, personally appeared before me this day and acknowledged that he is the Executor of the Estate of Mary Lou Venable, and that he, as Executor, being authorized to do so executed the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 25 day of June, 2020.

Julinda C Burnett Notary Publ

My commission expires: 11/15/2020

|   |                              | - 1 |
|---|------------------------------|-----|
| ٢ | MELINDA C. BURNETT           |     |
| ۱ | NOTARY PUBLIC                |     |
|   | Surry County, North Garolina |     |
|   | My Commission Expires        | -   |

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### EXHIBIT A

## A Conservation Easement for The State of North Carolina, Division of Mitigation Services, "Honey Mill Mitigation Site" SPO FILE NO. 86-BQ DMS SITE ID NO. 100083

Descriptions for Conservation Easement for the State of North Carolina, Division of Mitigation Services, Honey Mill Mitigation Site on the property of Mary Lou Venable, located in Eldora Township, Surry County, North Carolina. All references to the Surry County Register of Deed.

#### PIN: 5927-68-4669

### CE "A-1"

Beginning at a rebar with aluminum cap set (CE corner #1) at the intersection of the eastern right-of-way of State Road #1003 (Siloam Rd., 60' R/W) and the northern right-of-way of State Road #2029 (Little Mountain Church Rd., 50' R/W), said rebar being the southwest corner of Mary Lou Venable (now or formerly, see Deed Book 313, Pg. 722), said rebar being located S 85°25'54" W 317.25 feet from Site Control Point #2 (rebar with plastic cap) having NC Grid Coordinates [NAD83(2011)] N= 977,841.84 USft, E= 1,525,370.69 USft;

thence, from the point of Beginning, with the right-of-way of SR#1003, N 19°47'29" E a distance of 96.16' to a rebar with aluminum cap set;

thence, leaving said right-of-way, with the conservation easement, N 41°27'09" E a distance of 290.38' to a rebar with aluminum cap set;

thence N 27°16'20" E a distance of 275.59' to an existing iron stake on the common line of Mary Lou Venable and Verla V. Phillips et ux. (now or formerly, see Deed Book 1209, Pg. 520);

thence, with the common line, N 49°06'16" E a distance of 777.00' to an existing 2"axle;

thence N 03°30'00" E a distance of 297.00' to a calculated point;

thence N 80°00'00" E a distance of 118.80' to a calculated point;

thence N 40°11'32" E a distance of 324.92' to a calculated point;

thence N 58°53'05" E a distance of 341.88' to a calculated point;

thence N 73°53'05" E a distance of 50.77' to a rebar with aluminum cap set on the common line:

thence, leaving said common line, S 48°30'14" W a distance of 286.92' to a rebar with aluminum cap set;

thence S 68°23'49" W a distance of 125.12' to a rebar with aluminum cap set;

thence S 41°03'41" W a distance of 418.58' to a rebar with aluminum cap set;

thence S 19°22'43" W a distance of 288.27' to a rebar with aluminum cap set;

thence S 00°45'32" W a distance of 142.29' to a rebar with aluminum cap set;

thence S 43°54'58" E a distance of 132.47' to a rebar with aluminum cap set;

thence S 59°20'29" E a distance of 227.28' to a rebar with aluminum cap set;

thence S 47°36'35" E a distance of 190.07' to a rebar with aluminum cap set;

thence S 67°46'32" E a distance of 221.77' to a rebar with aluminum cap set;

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thence S 47°31'32" E a distance of 96.37' to a rebar with aluminum cap set; thence S 35°20'33" W a distance of 98.99' to a rebar with aluminum cap set; thence N 60°06'06" W a distance of 197.40' to a rebar with aluminum cap set; thence S 43°20'23" W a distance of 33.68' to a rebar with aluminum cap set; thence S 32°03'28" E a distance of 200.43' to a rebar with aluminum cap set; thence S 57°41'14" E a distance of 140.25' to a rebar with aluminum cap set on the common line of Mary Lou Venable and Randy Dean Venable et ux. (now or formerly, see Deed Book 1164, Pg. 942); thence, with the common line, S 30°50'56" W a distance of 106.04' to a rebar with aluminum cap set; thence, leaving said common line, N 56°15'04" W a distance of 169.56' to a rebar with aluminum cap set; thence N 30°11'18" W a distance of 168.48' to a rebar with aluminum cap set; thence N 53°28'40" W a distance of 332.79' to a rebar with aluminum cap set; thence N 26°37'57" W a distance of 275.42' to a rebar with aluminum cap set; thence N 08°04'28" W a distance of 40.77' to a rebar with aluminum cap set; thence N 53°15'04" W a distance of 132.37' to a rebar with aluminum cap set; thence S 45°49'48" W a distance of 404.55' to a rebar with aluminum cap set; thence S 31°20'27" W a distance of 257.72' to a rebar with aluminum cap set; thence S 40°58'17" W a distance of 127.89' to a rebar with aluminum cap set; thence S 14°27'58" W a distance of 326.14' to a rebar with aluminum cap set on the northern right-of-way of SR#2029; thence, with said right-of-way, N 67°00'25" W a distance of 52.32' to a calculated point; thence N 67°37'36" W a distance of 42.86' to a calculated point; thence N 68°56'02" W a distance of 148.33' to the point of Beginning;

containing 9.583 acres, more or less, and shown as CE "A-1" on a plat prepared by Turner Land Surveying, PLLC (P-0702) of Swannanoa, NC, entitled "Conservation Easement for the State of North Carolina, Division of Mitigation Services, Project: Honey Mill Mitigation Site" dated May 5, 2020 and recorded in Plat Book 37, Page 160 of the Surry County Register of Deeds.

## CE "A-2"

Beginning at a rebar with aluminum cap set (CE corner #58) on the common line of Mary Lou Venable (now or formerly, see Deed Book 313, Pg. 722), and Verla V. Phillips et ux. (now or formerly, see Deed Book 1209, Pg. 520, Tract 2), said rebar being located N 37°35'18" E 2,295.60 feet from Site Control Point #2 (rebar with plastic cap) having NC Grid Coordinates [NAD83(2011)] N= 977,841.84 USft, E= 1,525,370.69 USft;

thence, from the point of Beginning, with the common line, N 73°53'05" E a distance of 82.01' to a rebar with aluminum cap set;

thence N 16°53'05" E a distance of 79.20' to a calculated point;

thence N 45°36'55" W a distance of 101.23' to a rebar with aluminum cap set;

thence, leaving said common line, with the conservation easement, N 70°51'48" E a distance of 31.17' to a rebar with aluminum cap set;

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thence N 28°17'54" E a distance of 158.86' to a rebar with aluminum cap set; thence N 56°59'52" E a distance of 111.97' to a rebar with aluminum cap set; thence N 37°41'23" E a distance of 207.66' to a rebar with aluminum cap set; thence N 47°06'11" W a distance of 115.16' to a rebar with aluminum cap set on the common line of Mary Lou Venable's property (now or formerly, see Deed Book 205, Pg. 495); thence, with the common line, N 46°59'11" E a distance of 19.02' to a calculated point; thence S 74°00'49" E a distance of 383.60' to a rebar with aluminum cap set at the mouth of Honey Branch on the western line of Verla V. Phillips et ux. (now or formerly, see Deed Book 1209, Pg. 520, Tract 1) thence, with the common line and with the centerline of Honey Branch, S 18°34'43" W a distance of 14.33' to a calculated point; thence S 27°43'03" W a distance of 9.09' to a calculated point; thence S 10°29'51" E a distance of 14.82' to a rebar with aluminum cap set; thence, leaving said common line, N 76°27'08" W a distance of 165.87' to a rebar with aluminum cap set; thence S 36°00'31" W a distance of 229.84' to a rebar with aluminum cap set; thence S 47°24'28" W a distance of 243.69' to a rebar with aluminum cap set; thence S 19°53'53" W a distance of 141.97' to a rebar with aluminum cap set; thence S 25°13'27" E a distance of 136.05' to a rebar with aluminum cap set; thence S 49°33'06" E a distance of 215.41' to a rebar with aluminum cap set; thence S 42°43'11" W a distance of 125.77' to a rebar with aluminum cap set; thence N 40°17'12" W a distance of 401.72' to the point of Beginning;

containing 2.795 acres, more or less, and shown as CE "A-2" on a plat prepared by Turner Land Surveying, PLLC (P-0702) of Swannanoa, NC, entitled "Conservation Easement for the State of North Carolina, Division of Mitigation Services, Project: Honey Mill Mitigation Site" dated May 5, 2020 and recorded in Plat Book 37, Page 160 of the Surry County Register of Deeds.

## PIN: 5928-60-5518

## CE "B"

Beginning at a rebar with aluminum cap set (CE corner #35) on the common line of Mary Lou Venable's properties (now or formerly, see Deed Book 313, Pg. 722 and Deed Book 205, Pg. 495), said rebar being located N 34°22'48" E 2,959.16 feet from Site Control Point #2 (rebar with plastic cap) having NC Grid Coordinates [NAD83(2011)] N= 977,841.84 USft, E= 1,525,370.69 USft;

Thence, from the point of Beginning, leaving the common line, with the conservation easement, N 47°06'11" W a distance of 226.94' to a rebar with aluminum cap set; thence N 01°11'34" E a distance of 53.23' to a rebar with aluminum cap set; thence N 72°34'47" W a distance of 59.96' to a rebar with aluminum cap set; thence N 44°08'33" W a distance of 45.02' to a rebar with aluminum cap set; thence N 63°45'37" E a distance of 49.83' to a rebar with aluminum cap set; thence S 73°50'51" E a distance of 49.45' to a rebar with aluminum cap set;

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thence S 55°48'03" E a distance of 225.98' to a rebar with aluminum cap set; thence S 20°42'13" E a distance of 115.08' to a rebar with aluminum cap set; thence S 49°47'33" E a distance of 47.38' to a rebar with aluminum cap set;

thence N 81°58'06" E a distance of 105.30' to a rebar with aluminum cap set;

thence S 78°35'09" E a distance of 117.68' to a rebar with aluminum cap set on the common

line of Mary Lou Venable and Verla V. Phillips et ux. (now or formerly, see Deed Book 1209, Pg. 520, Tract 1);

thence, with the common line, S 35°33'07" E a distance of 104.57' to a rebar with aluminum cap set at the mouth of Honey Branch at the common corner of Mary Lou Venable's properties and Verla V. Phillips;

thence, leaving the Phillips line, with the Venable common line, N 74°00'49" W a distance of 383.60' to a calculated point;

thence S 46°59'11" W a distance of 19.02' to the point of Beginning;

containing 1.084 acres, more or less, and shown as CE "B" on a plat prepared by Turner Land Surveying, PLLC (P-0702) of Swannanoa, NC, entitled "Conservation Easement for the State of North Carolina, Division of Mitigation Services, Project: Honey Mill Mitigation Site" dated May 5, 2020 and recorded in Plat Book <u>3.7</u>, Page <u>160</u> of the Surry County Register of Deeds.

BK 1714 PG 859 - 871 (13) DOC# 673747 This Document eRecorded: 06/24/2020 Fee: \$26.00 Surry County, North Carolina Carolyn M. Comer, Register of Deeds Received By: JENNIFER CROUSE

Tax: \$172.00

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EXCISE Stang \$172.00 STATE OF NORTH CAROLINA

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

**SURRY COUNTY** 

SPO File Numbers: 86-BR DMS Project Number: 100083

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 24<sup>th</sup> day of June, 2020, by LuAnn Venable Browne and spouse Charles Edward Brown, ("Grantor"), whose mailing address is 929 Siloam Road, Mount Airy, NC 27030 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 <u>et seq.</u>, 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

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AG reviewed 11 May 2017

Submitted electronically by "Hiatt & Fawcett, PLLC" in compliance with North Carolina statutes governing recordable documents and the terms of the submitter agreement with the Surry County Register of Deeds. 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 7619.

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 8<sup>th</sup> 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 Eldora Township, Surry County, North Carolina (the "Property"), and being more

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particularly described as that certain parcel of land containing approximately 30.82 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 1209, Page 520 (Tract 2)** of the Surry 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 Venable 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 Area C containing a total of 6.863 acres as shown on the plats of survey entitled "Conservation Easement Survey for the State of North Carolina: Division of Mitigation Services, Honey Mill Mitigation Site, SPO File No. 86-BR, DMS Site ID No. 100083", Elisabeth Turner (License # L-4440) and recorded in the Surry County, North Carolina Register of Deeds at Plat Book 37, Page /60.

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.

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#### 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.

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**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: Division of Mitigation Services, Honey Mill Mitigation Site, SPO File No. 86-BR, DMS Site ID No. 100083", (Elisabeth Turner, PLS #L-4440) and recorded in the Surry County, North Carolina Register of Deeds at Plat Book <u>37</u> Page <u>160</u> 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 subterraneous water flow.

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

**D.** Fences. Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the

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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

Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is A. 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,

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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.

wible (SEAL)

LuAnn Venable Browne

(SEAL)

Charles Edward Browne

NCDMS Full Delivery Conservation Easement Template

AG reviewed 11 May 2017

## DOC# 673747

#### NORTH CAROLINA COUNTY OF <u>SURRY</u>

I, Melinda C. Burnett, a Notary Public in and for the County and State aforesaid, do hereby certify that LuAnn Venable Browne, 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 24<sup>th</sup> day of June, 2020.

Inda C Burnett Notary Publi

My commission expires:

11/15/2020

MELINDA C. BURNETT NOTARY PUBLIC Surry County, North Carolina My Commission Expires

NORTH CAROLINA COUNTY OF <u>SURRY</u>

I. Melinda C. Burnett, a Notary Public in and for the County and State aforesaid, do hereby certify that Charles Edward Browne, 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 24<sup>th</sup> day of June, 2020.

linda C Burnett Notary P

MELINDA C. BURNETT NOTARY PUBLIC Surry County, North Carplina My Commission Expires 山口パンン

My commission expires:

11/15/2020

NCDMS Full Delivery Conservation Easement Template

AG reviewed 11 May 2017

## DOC# 673747

#### EXHIBIT A

## A Conservation Easement for The State of North Carolina, Division of Mitigation Services, "Honey Mill Mitigation Site" SPO FILE NO. 86-BR DMS SITE ID NO. 100083

Descriptions for Conservation Easement for the State of North Carolina, Division of Mitigation Services, Honey Mill Mitigation Site on the property of Mary Lou Venable and of Charles E. Browne and LuAnn Venable Browne, located in Eldora Township, Surry County, North Carolina. All references to the Surry County Register of Deed.

#### PIN: 5927-59-9301

#### CE "C"

Beginning at an existing iron stake (CE corner #4) on the common line of Verla V. Phillips et ux. (now or formerly, see Deed Book 1209, Pg. 520, Tract 2) and Mary Lou Venable (now or formerly, see Deed Book 313, Pg. 722), said rebar being located N 03°46'32" E 528.96 feet from Site Control Point #2 (rebar with plastic cap) having NC Grid Coordinates [NAD83(2011)] N= 977,841.84 USft, E= 1,525,370.69 USft;

thence, from the point of Beginning, with the conservation easement, N 42°41'22" E a distance of 183.38' to a rebar with aluminum cap set;

thence N 48°30'08" E a distance of 326.31' to a rebar with aluminum cap set; thence N 23°06'36" E a distance of 193.46' to a rebar with aluminum cap set; thence N 78°51'04" W a distance of 397.42' to a rebar with aluminum cap set; thence N 64°44'11" W a distance of 225.49' to a rebar with aluminum cap set; thence N 46°22'47" W a distance of 260.93' to a rebar with aluminum cap set; thence N 24°41'13" W a distance of 137.93' to a rebar with aluminum cap set; thence N 66°41'50" E a distance of 91.60' to a rebar with aluminum cap set; thence S 38°43'31" E a distance of 251.03' to a rebar with aluminum cap set; thence S 56°25'14" E a distance of 225.27' to a rebar with aluminum cap set; thence S 77°58'15" E a distance of 241.17' to a rebar with aluminum cap set; thence S 75°03'22" E a distance of 164.41' to a rebar with aluminum cap set; thence N 35°56'36" E a distance of 276.25' to a rebar with aluminum cap set; thence N 55°33'37" E a distance of 186.24' to a rebar with aluminum cap set; thence N 59°20'42" W a distance of 232.68' to a rebar with aluminum cap set; thence N 73°16'53" W a distance of 176.33' to a rebar with aluminum cap set; thence N 14°15'02" E a distance of 86.09' to a rebar with aluminum cap set; thence S 79°08'26" E a distance of 141.90' to a rebar with aluminum cap set; thence S 62°48'14" E a distance of 156.42' to a rebar with aluminum cap set; thence S 56°22'07" E a distance of 139.57' to a rebar with aluminum cap set; thence N 54°07'50" E a distance of 372.83' to a rebar with aluminum cap set; thence N 07°45'32" W a distance of 52.67' to a rebar with aluminum cap set;

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Deeds.

## DOC# 673747

thence N 53°27'31" E a distance of 27.11' to a rebar with aluminum cap set; thence S 72°26'37" E a distance of 51.39' to a rebar with aluminum cap set; thence N 44°33'32" E a distance of 148.81' to a rebar with aluminum cap set; thence N 70°51'48" E a distance of 142.03' to a rebar with aluminum cap set on the common line of Verla V. Phillips and Mary Lou Venable; thence, with said common line, S 45°36'55" E a distance of 101.23' to a calculated point thence S 16°53'05" W a distance of 79.20' to a calculated point; thence S 73°53'05" W a distance of 82.01' to a rebar with aluminum cap set; thence S 73°53'05" W a distance of 95.58' to a rebar with aluminum cap set; thence S 73°53'05" W a distance of 50.77' to a calculated point; thence S 58°53'05" W a distance of 341.88' to a calculated point; thence S 40°11'32" W a distance of 324.92' to a calculated point; thence S 80°00'00" W a distance of 118.80' to a calculated point; thence S 03°30'00" W a distance of 297.00' to an existing 2"axle; thence S 49°06'16" W a distance of 777.00' to the point of Beginning; containing 6.863 acres, more or less, and shown as CE "C" on a plat prepared by Turner Land Surveying, PLLC (P-0702) of Swannanoa, NC, entitled "Conservation Easement for the State of North Carolina, Division of Mitigation Services, Project: Honey Mill Mitigation Site" dated May 5, 2020 and recorded in Plat Book 37, Page 160 of the Surry County Register of

NCDMS Full Delivery Conservation Easement Template

## **APPENDIX 9 – Maintenance Plan**

# Appendix 9 Maintenance Plan

The site shall be visited semi-annually and a physical inspection of the site shall be conducted a minimum of once per year throughout the post-construction monitoring period for seven years. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following:

| Component/<br>Feature | Maintenance through project close-out                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Stream                | Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing of loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel – these shall be conducted where success criteria are threatened or at the discretion of the Designer. Areas where storm water and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting. Beaver activity will be monitored and beaver dams on project streams will typically be removed, at the discretion of the Designer, during the monitoring period to allow for bank stabilization and stream development outside of this type of influence. |  |
| Vegetation            | <ul> <li>Vegetation shall be maintained to ensure the health and vigor of the targeted community.<br/>Routine vegetation maintenance and repair activities may include supplemental planting,<br/>pruning, mulching, and fertilizing. Exotic invasive plant species requiring treatment per the<br/>Invasive Species Treatment Plan shall be treated using a combination of best professional<br/>judgement and recommendations from that plan, in accordance with NC Department of<br/>Agriculture (NCDA) rules and regulations.</li> </ul>                                                                                                                                                                                                              |  |
| Site boundary         | Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as-needed basis.                                                                                                                                                                                                                                                                                                                                                        |  |

## Table 1. Maintenance Plan – Honey Mill Mitigation Site



## **APPENDIX 10 – Financial Assurance**

# Appendix 10 Financial Assurances

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



## **APPENDIX 11 – Credit Release Schedule**

# Appendix 11 - Credit Release Schedule and Supporting Information

All credit releases will be based on the total credit generated as reported in the approved final mitigation plan, unless there are discrepancies which indicate additional credits may be warranted, in which case an addendum will be proposed to the IRT. Under no circumstances shall any mitigation project be debited until the necessary Department of the Army (DA) authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard.

The following conditions apply to the credit release schedules:

- A. A reserve of 10% of a site's total stream credits will be released after four bankfull events have occurred, in separate years, provided the channel is stable and all other performance standards are met. In the event that less than four bankfull events occur during the monitoring period, release of these reserve credits is at the discretion of the IRT.
- B. For mitigation banks, implementation of the approved Mitigation Plan must be initiated no later than the first full growing season after the date of the first credit transaction (credit sale).
- C. After the second milestone, the credit releases are scheduled to occur on an annual basis, assuming that the annual monitoring report has been provided to the USACE in accordance with the General Monitoring Requirements, and that the monitoring report demonstrates that interim performance standards are being met and that no other concerns have been identified on-site during the visual monitoring. All credit releases require written approval from the USACE.
- D. The credits associated with the final credit release milestone will be released only upon a determination by the USACE, in consultation with the NCIRT, of functional success as defined in the Mitigation Plan.

The schedules below list the updated credit release schedules for stream and wetland mitigation projects developed by bank and ILF sites in North Carolina:



#### Table A: Stream Credit Release Schedule

| Credit Release Schedule and Milestones for Streams |                                                                     |                    |                       |  |
|----------------------------------------------------|---------------------------------------------------------------------|--------------------|-----------------------|--|
| Credit                                             |                                                                     |                    | ILF/NCDMS             |  |
| Release<br>Milestone                               | Release Activity                                                    | Interim<br>Release | Total<br>Released     |  |
|                                                    | Completion of all initial physical and biological improvements made | 2004               | 2001                  |  |
| 2*                                                 | pursuant to the Mitigation Plan                                     | 30%                | 30%                   |  |
|                                                    | Year 1 monitoring report demonstrates that channels are stable and  |                    |                       |  |
| 3                                                  | interim performance standards have been met                         | 10%                | 40%                   |  |
|                                                    | Year 2 monitoring report demonstrates that channels are stable and  | 1.00/              | 5.00/                 |  |
| 4                                                  | interim performance standards have been met                         | 10%                | 50%                   |  |
|                                                    | Year 3 monitoring report demonstrates that channels are stable and  |                    |                       |  |
| 5                                                  | interim performance standards have been met                         | 10%                | 60%                   |  |
|                                                    | Year 4 monitoring report demonstrates that channels are stable and  |                    | 65%                   |  |
| 6**                                                | interim performance standards have been met                         | 5%                 | (75%***)              |  |
|                                                    | Year 5 monitoring report demonstrates that channels are stable and  | 1.00/              | 75%                   |  |
| 7                                                  | interim performance standards have been met                         | 10%                | (85% <sup>***</sup> ) |  |
|                                                    | Year 6 monitoring report demonstrates that channels are stable and  |                    | 80%                   |  |
| 8**                                                | interim performance standards have been met                         | 5%                 | (90%***)              |  |
|                                                    | Year 7 monitoring report demonstrates that channels are stable,     | 1.00/              | 90%                   |  |
| 9                                                  | performance standards have been met                                 | 10%                | (100%***)             |  |

\*For ILF sites (including all NCDMS projects), no initial release of credits (Milestone 1) is provided because ILF programs utilized advance credits, so no initial release is necessary to help fund site construction. To account for this, the 15% credit release associated with the first milestone (bank establishment) is held until the second milestone, so that the total credits release at the second milestone is 30%. In order for NCDMS to receive the 30% release (shown in the schedules as Milestone 2), they must comply with the credit release requirements stated in Section IV(I)(3) of the approved NCDMS Instrument.

\*\*Please note that vegetation data may not be required with monitoring reports submitted during these monitoring years unless otherwise required by the Mitigation Plan or directed by the NCIRT.

\*\*\*10% reserve of credits to be held back until the bankfull event performance standard has been met.



## **APPENDIX 12 – Preliminary Plans**



| Date:         09.23.2020           Job Number:         005-02178 | Rev isi ons: | Honey Mill Mitigation Site   | CAROLINIA CAROLINI |                                                                |
|------------------------------------------------------------------|--------------|------------------------------|--------------------|----------------------------------------------------------------|
| Project Engineer: ASE<br>Drawn By: JK/CG<br>Checked By: EGR      |              | Surry County, North Carolina | SEAL 7:            | WILDLANDS                                                      |
|                                                                  |              |                              | CONCERNENCE -      | ENGINEERING<br>1430 South Mint Street, Suite 104               |
| C <sup>sheet</sup> U.L                                           |              | litle Sheet                  | 7-13-20            | Charlotte, NC 28203<br>Tel: 704.332.7754<br>License No. F-0831 |

|                                                                                                                                         | 0.1                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                         | 0.2                                                                                                                                             |
|                                                                                                                                         | 0.3                                                                                                                                             |
|                                                                                                                                         | 1.1-1.7                                                                                                                                         |
|                                                                                                                                         | 2.1-2.10<br>2.11<br>2.12-2.17<br>2.18-2.22<br>2.37<br>2.23-2.28<br>2.29-2.31<br>2.32-2.33<br>2.34-2.36<br>3.1-3.7<br>4.1<br>5.1-5.6<br>6.1-6.13 |
|                                                                                                                                         | 7.1-7.6                                                                                                                                         |
| irectory                                                                                                                                |                                                                                                                                                 |
| Owner:<br>NC DEQ - Division of<br>Mitigation Services<br>1652 Mail Service Cente<br>Raleigh, NC 27699<br>Kelly Phillips<br>919-707-8291 | er                                                                                                                                              |
| DMS ID 100083                                                                                                                           |                                                                                                                                                 |
| USACE ID No. SAW-2                                                                                                                      | 018-01789                                                                                                                                       |
| NC DWR No. 20181271                                                                                                                     | L                                                                                                                                               |
|                                                                                                                                         |                                                                                                                                                 |



#### **General Notes**

- All sediment and erosion control practices shall comply with the North Carolina Erosion and Sediment Control Planning and Design Manual.
- 2. Contractor shall disturb only as much channel bank as can be stabilized with temporary seeding, mulch, and erosion control matting by the end of each workday.
- 3. Contractor will install pump-around systems to divert flow while working in live, flowing channels. Contractor shall not remove pump-around systems and advance to the next work area until the current work area is completed and stabilized. If flow is not sufficient at the time of construction to cause sedimentation to downstream waters, pump-around operations will not be required. In these cases, rock silt check dams will be installed near the downstream extent of the work area for the current phase Contractor shall take measures necessary to ensure that storm flows do not damage work areas or create sedimentation of aquatic habitat.
- 4. Locations for staging, stockpile areas, and stream crossings have been provided. Additional or alternative staging and/or stockpile areas and stream crossings may be utilized by the Contractor provided that all practices comply with the North Carolina Erosion and Sediment Control Planning and Design Manual, that the areas are located within the permitted limits of disturbance, and that the areas are approved by Engineer prior to implementation.
- 5. The Engineer will field walk the site with the Contractor prior to work beginning and field flag vegetation to be used as transplant material. Vegetation to be used as transplant material (juncus, alders, small trees, and sod mats) shall

not be disturbed until Contractor is prepared to install transplants

- Contractor shall not exceed the limits of disturbance shown 6. on the plans.
- Various types of constructed riffles and cascades are 7 specified on the plans. Contractor will build the specific types of constructed riffles and cascades at locations shown on the plans. Changes in type or riffle or cascade must be approved by the Engineer
- 8. Topsoil will be harvested, stockpiled, and reapplied to the extent that it is encountered.
- 9 Soil amendment is discussed in the permanent seeding specification. Amendments will be applied to assist with grass establishment and tree growth in some or all disturbed areas. The limits of application will be determined by the Engineer in the field.
- 10. Leaf litter will be harvested form adjacent wooded areas and applied to the project site. The contractor will be paid based on area of coverage. The contractor will be expected to harvest leaf litter until supply has been exhausted from reasonably accessible areas adjacent to the site.

#### **Construction Sequence**

- The Contractor shall coordinate with Engineer to setup 1 meeting with regional (Winston-Salem) NCDEQ office for pre-construction SEC meeting.
- Contact North Carolina "ONE CALL" Center
- (1.800.632.4949) before any excavation.
- Mobilize equipment and materials to the site. 4 Identify and establish construction entrances, staging and
- stockpile areas, temporary access roads, erosion and

sediment control practices, and stream crossings as indicated on the plans for work areas.

- 5. Set up temporary facilities, locate equipment within staging areas, and stockpile materials needed for the initial stages of construction within stockpile area(s). 6. Install and maintain onsite rain gauge and log books for
- NPDES and SEC permit requirements.
- 7. Construction shall progress from upstream to downstream. Active construction areas shall not flow to completed construction areas to prevent sedimentation of recent constructed habitat. The only exception to this is permanent stream crossings, which may be installed at the end of construction to prevent loading by BMPs at the upstream extent of tributaries shall be constructed before downstream channel work. Detailed construction sequencing shall be determined by the Contractor and the Contractor shall provide a schedule to the Engineer prior to commencement
- 8. Perform any necessary clearing and grubbing in phases as work progresses. Bank vegetation and vegetation immediately adjacent to live channels shall be left undisturbed as long as possible.
- 9. A pump-around system is required when working in the live stream. Install impervious dikes at upstream and downstream ends of pump-around locations. The pump-around operation shall be performed between these dike locations.
- 10. Perform excavation and grading of channel and floodplain 11. Stockpile soil as necessary. Ensure that erosion and sediment control practices are properly installed and functioning in stockpile areas as shown on the Erosion and

Sediment Control Plan (SEC Plan).

- 12. Construct in-stream structures and install riffle and cascade features according to plans, details, and specifications as construction progresses.
- 13. Seed and/or sod, mat, and mulch banks and floodplain areas according to plans and details.
- 14. Once disturbed areas and exposed slopes are stabilized, remove pump-around system, if used, and progress to the next phase.
- 15. Backfill abandoned channel sections with stockpiled soil. All non-native, invasive species shall be treated and/or removed from the old channel prior to backfilling.
- 16. Seed and mulch or sod any backfill sections before proceeding to next phase.
- 17. Once all phases of channel, floodplain, and wetland
- construction are complete, prepare the floodplain for planting per the specifications.
- 18. Remove temporary stream crossings, stockpile areas, and erosion and sediment control practices. 19. Apply temporary and permanent seed, mulch, and
- vegetation in the floodplain 20. Ensure that the site is free of trash, debris, and any leftover
- construction materials prior to demobilization.
- 21. Demobilize grading equipment from the site.

**Proposed Structures** 

Proposed Log Sill

See Detail 2. Sheet 6.4

22. Seed, mulch and stabilize staging areas and stockpile areas. 23. Demobilize all equipment, offices, buildings, and other facilities assembled on the site.

## **Existing Features**

- — — — Existing Property Line — · — · — · — · — Existing Thalweg Alignment
- Existing Major Contour (5' Interval)
- Existing Minor Contour
- TOB TOB Existing Top of Bank
- OU ----- OU ----- Existing Overhead Utility Line
- OUE ------ OUE ------ Existing Overhead Utility Easement
- -( )-**Existing Utility Pole** Existing Storm Pipe
  - x ----- x ----- x -----Existing Fence









Existing Bedrock



Existing Tree

# **Proposed Structures**

\_\_\_\_ · · · · \_ · · · · \_ · · · · \_ Proposed Bankfull

**Proposed Features** 

------ CE ------- CE ------- Recorded Conservation Easement

- CE-IX ------ CE-IX ------ Recorded Internal Conservation Easement Break 

Proposed Thalweg Alignment



10+00

-100------

Proposed Various Constructed Riffles See Sheets 6.1-6.2

Proposed Major Contour (5' Interval)

Proposed Minor Contour



Proposed Rock Cascade



Proposed Brush Toe See Sheet 6.7



Proposed Vegetated Soil Lift See Detail 1. Sheet 6.4



Proposed Debris Removal



Proposed BMP - Bioretention Cell See Detail 2 & 3, Sheet 6.9





See Detail 1, Sheet 6.3





Proposed BMP - SPSC



- Topographic survey was completed by Turner Land Surveying in November 2019.
- Topographic data outside of survey limits was supplemented with LiDAR data from 2016.
- Parcel boundary survey was completed by Turner Land Surveying in December 2019.

4. Final plan set supersedes other construction aids such as, but not limited to, digital surface models, GPS models, or other hard copy exhibits not included in the plan set.

## **Erosion Control Features**

– LOD —— LOD — — SAF — SAF — SAF — – [X] —— [X] —— [X] —





Proposed Limits of Disturbance Proposed Safety Fence See Detail 4, Sheet 6.6

Proposed Silt Fence See Detail 4, Sheet 6.5

Proposed Haul Road

Proposed Silt Fence Outlet See Detail 2, Sheet 6.6

Proposed Temporary Crossing See Detail 2. Sheet 6.5

Proposed Construction Entrance See Detail 3, Sheet 6.6

Proposed Pump Around System See Detail 3, Sheet 6.5



















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| Riparian | Planting |
|----------|----------|
|          |          |

|                            | 1                                               | 0                      |         |                       |                              |  |
|----------------------------|-------------------------------------------------|------------------------|---------|-----------------------|------------------------------|--|
| Permanent Riparian Seeding |                                                 |                        |         |                       |                              |  |
|                            | Pur                                             | e Live Seed            |         |                       |                              |  |
| Approved Date              | Species Name                                    | Common Name            | Stratum | Density<br>(Ibs/acre) | Wetland<br>Indicator<br>Code |  |
| All Year                   | Schizachyrium<br>scoparium                      | Little Bluestem        | Herb    | 1.5                   | FACU                         |  |
| All Year                   | Panicum virgatum                                | Switchgrass            | Herb    | 1.0                   | FAC                          |  |
| All Year                   | Sorghastrum nutans                              | Indiangrass            | Herb    | 1.5                   | FACU                         |  |
| All Year                   | Panicum<br>dichotimiflorum                      | Smooth<br>Pannicgrass  | Herb    | 1.0                   | FACW                         |  |
| All Year                   | Panicum anceps                                  | Beaked Panicgrass      | Herb    | 1.0                   | FAC                          |  |
| All Year                   | Panicum clandestinum                            | Deertongue             | Herb    | 3.0                   | FAC                          |  |
| All Year                   | Elymus virginicus                               | Virginia Wild Rye      | Herb    | 3.0                   | FACW                         |  |
| All Year                   | Tripsacum dactyloides                           | Eastern<br>Gammagrass  | Herb    | 1.0                   | FACW                         |  |
| All Year                   | Juncus tenuis                                   | Path Rush              | Herb    | 0.6                   | FAC                          |  |
| All Year                   | Juncus effusus                                  | Soft Rush              | Herb    | 0.4                   | FACW                         |  |
| All Year                   | Carex vulpinoidea                               | Fox Sedge              | Herb    | 1.0                   | OBL                          |  |
| All Year                   | Coreopsis lanceolata                            | Lanceleaf<br>Coreopsis | Herb    | 1.0                   | FACU                         |  |
| All Year                   | Bidens aristosa                                 | Bur-Marigold           | Herb    | 1.0                   | FACW                         |  |
| All Year                   | Rudbeckia hirta                                 | Blackeyed Susan        | Herb    | 1.0                   | FACU                         |  |
| All Year                   | Chamaecrista<br>fasciculata var.<br>fasciculata | Partridge Pea          | Herb    | 1.0                   | FACU                         |  |
| All Year                   | Achillea millefolium                            | Common Yarrow          | Herb    | 1.0                   | FACU                         |  |

### Streambank Planting

| Streambank Planting Zone |                                          |                     |                         |                  |         |            |                           |  |
|--------------------------|------------------------------------------|---------------------|-------------------------|------------------|---------|------------|---------------------------|--|
|                          | Live Stakes: Streams with > 8' TOB width |                     |                         |                  |         |            |                           |  |
| Species                  | Common Name                              | Max<br>Spacing (ft) | Indiv.<br>Spacning (ft) | Min. Size        | Stratum | Percentage | Wetland<br>Indicator Code |  |
| Salix nigra              | Black Willow                             | 6                   | 3' - 6'                 | 0.5" cal.        | Canopy  | 35%        | OBL                       |  |
| Salix sericea            | Silky Willow                             | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 25%        | OBL                       |  |
| Cornus amomum            | Silky dogwood                            | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 20%        | FACW                      |  |
| Sambucus canadensis      | Elderberry                               | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FAC                       |  |
| Physocarpos opulifolius  | Ninebark                                 | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FACW                      |  |
|                          |                                          |                     |                         |                  | Total   | 100%       |                           |  |
|                          | Live Stake                               | s: Streams wi       | th < 8' TOB widt        | h                |         |            |                           |  |
| Salix sericea            | Silky Willow                             | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 40%        | OBL                       |  |
| Cornus amomum            | Silky Dogwood                            | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |  |
| Sambucus canadensis      | Elderberry                               | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FAC                       |  |
| Physocarpos opulifolius  | Ninebark                                 | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |  |
|                          |                                          |                     |                         |                  | Total   | 100%       |                           |  |
|                          |                                          | Herbaceous          | Plugs                   |                  |         |            |                           |  |
| Juncus effusus           | Common Rush                              | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 50%        | FACW                      |  |
| Carex lurida             | Shallow Sedge                            | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 20%        | OBL                       |  |
| Carex crinita            | Fringed Sedge                            | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | OBL                       |  |
| Cyperus strigosus        | Straw-colored Flatsedge                  | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | FACW                      |  |
|                          |                                          |                     |                         |                  | Total   | 100%       |                           |  |

| Streambank Planting Zone                 |                         |                     |                         |                  |         |            |                           |
|------------------------------------------|-------------------------|---------------------|-------------------------|------------------|---------|------------|---------------------------|
| Live Stakes: Streams with > 8' TOB width |                         |                     |                         |                  |         |            |                           |
| Species                                  | Common Name             | Max<br>Spacing (ft) | Indiv.<br>Spacning (ft) | Min. Size        | Stratum | Percentage | Wetland<br>Indicator Code |
| Salix nigra                              | Black Willow            | 6                   | 3' - 6'                 | 0.5" cal.        | Canopy  | 35%        | OBL                       |
| Salix sericea                            | Silky Willow            | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 25%        | OBL                       |
| Cornus amomum                            | Silky dogwood           | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 20%        | FACW                      |
| Sambucus canadensis                      | Elderberry              | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FAC                       |
| Physocarpos opulifolius                  | Ninebark                | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FACW                      |
|                                          |                         |                     |                         |                  | Total   | 100%       |                           |
|                                          | Live Stake              | s: Streams wit      | th < 8' TOB widt        | h                |         |            |                           |
| Salix sericea                            | Silky Willow            | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 40%        | OBL                       |
| Cornus amomum                            | Silky Dogwood           | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |
| Sambucus canadensis                      | Elderberry              | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FAC                       |
| Physocarpos opulifolius                  | Ninebark                | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |
|                                          |                         |                     |                         |                  | Total   | 100%       |                           |
|                                          |                         | Herbaceous          | Plugs                   |                  |         |            |                           |
| Juncus effusus                           | Common Rush             | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 50%        | FACW                      |
| Carex lurida                             | Shallow Sedge           | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 20%        | OBL                       |
| Carex crinita                            | Fringed Sedge           | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | OBL                       |
| Cyperus strigosus                        | Straw-colored Flatsedge | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | FACW                      |
|                                          |                         |                     |                         |                  | Total   | 100%       |                           |

| Streambank Planting Zone |                         |                     |                         |                  |         |            |                           |
|--------------------------|-------------------------|---------------------|-------------------------|------------------|---------|------------|---------------------------|
|                          | L                       | ive Stakes: Str     | reams with > 8'         | TOB width        |         |            |                           |
| Species                  | Common Name             | Max<br>Spacing (ft) | Indiv.<br>Spacning (ft) | Min. Size        | Stratum | Percentage | Wetland<br>Indicator Code |
| Salix nigra              | Black Willow            | 6                   | 3' - 6'                 | 0.5" cal.        | Canopy  | 35%        | OBL                       |
| Salix sericea            | Silky Willow            | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 25%        | OBL                       |
| Cornus amomum            | Silky dogwood           | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 20%        | FACW                      |
| Sambucus canadensis      | Elderberry              | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FAC                       |
| Physocarpos opulifolius  | Ninebark                | 6                   | 3' - 6'                 | 0.5" cal.        | Shrub   | 10%        | FACW                      |
|                          |                         |                     |                         |                  | Total   | 100%       |                           |
|                          | Live Stake              | s: Streams wi       | th < 8' TOB widt        | h                |         |            |                           |
| Salix sericea            | Silky Willow            | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 40%        | OBL                       |
| Cornus amomum            | Silky Dogwood           | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |
| Sambucus canadensis      | Elderberry              | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FAC                       |
| Physocarpos opulifolius  | Ninebark                | 8                   | 6-8                     | 0.5" cal.        | Shrub   | 20%        | FACW                      |
|                          |                         |                     |                         |                  | Total   | 100%       |                           |
|                          |                         | Herbaceous          | Plugs                   |                  |         |            |                           |
| Juncus effusus           | Common Rush             | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 50%        | FACW                      |
| Carex lurida             | Shallow Sedge           | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 20%        | OBL                       |
| Carex crinita            | Fringed Sedge           | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | OBL                       |
| Cyperus strigosus        | Straw-colored Flatsedge | 4                   | 4                       | 1.0" - 2.0" plug | Herb    | 15%        | FACW                      |
|                          |                         |                     |                         |                  | Total   | 100%       |                           |

SEE DETAIL 1, SHEET 6.8 FOR STREAMBANK PLANTING.

# Herbaceous Zone

| Herbaceous Zone      |                     |                   |            |                           |  |
|----------------------|---------------------|-------------------|------------|---------------------------|--|
| Species              | Common Name         | Indiv.<br>Spacing | Percentage | Wetland<br>Indicator Code |  |
| Juncus effusus       | Common Rush         | 4 ft.             | 40%        | FACW                      |  |
| Carex lurida         | Lurid Sedge         | 4 ft.             | 15%        | OBL                       |  |
| Carex crinita        | Fringed Sedge       | 4 ft.             | 15%        | OBL                       |  |
| Scirpus cyperinus    | Woolgrass           | 4 ft.             | 15%        | FACW                      |  |
| Sagittaria latifolia | Broadleaf Arrowhead | 4 ft.             | 15%        | OBL                       |  |

| Riparian Planting Zone    |                             |                     |                        |                 |           |            |                                                                             |  |  |  |  |  |  |  |
|---------------------------|-----------------------------|---------------------|------------------------|-----------------|-----------|------------|-----------------------------------------------------------------------------|--|--|--|--|--|--|--|
| Species                   | Common Name                 | Max Spacing<br>(ft) | Indiv.<br>Spacing (ft) | Min.<br>Caliper | Stratum   | Percentage | Wetland<br>Indicator Code                                                   |  |  |  |  |  |  |  |
| Platanus occidentalis     | Sycamore                    | 12                  | 6-12                   | 0.25"           | Canopy    | 15%        | FACW                                                                        |  |  |  |  |  |  |  |
| Morus rubra*              | Red Mulberry                | 12                  | 6-12                   | 0.25"           | Subcanopy | 7%         | FACU                                                                        |  |  |  |  |  |  |  |
| Diospyros virginiana      | Persimmon                   | 12                  | 6-12                   | 0.25"           | Canopy    | 10%        | FAC                                                                         |  |  |  |  |  |  |  |
| Prunus serotina           | Black Cherry                | 12                  | 6-12                   | 0.25"           | Canopy    | 10%        | FACU                                                                        |  |  |  |  |  |  |  |
| Quercus rubra             | Northern Red Oak            | 12                  | 6-12                   | 0.25"           | Canopy    | 10%        | FACU                                                                        |  |  |  |  |  |  |  |
| Oxydendrum arboreum*      | Sourwood                    | 12                  | 6-12                   | 0.25"           | Subcanopy | 3%         | UPL                                                                         |  |  |  |  |  |  |  |
| Quercus alba              | White Oak                   | 12                  | 6-12                   | 0.25"           | Canopy    | 10%        | FACU                                                                        |  |  |  |  |  |  |  |
| Asimina triloba*          | Paw Paw                     | 12                  | 6-12                   | 0.25"           | Subcanopy | 4%         | FAC                                                                         |  |  |  |  |  |  |  |
| Ulmus rubra               | Slippery Elm                | 12                  | 6-12                   | 0.25"           | Canopy    | 5%         | FAC                                                                         |  |  |  |  |  |  |  |
| Acer negundo              | Boxelder                    | 12                  | 6-12                   | 0.25"           | Canopy    | 10%        | FAC                                                                         |  |  |  |  |  |  |  |
| Hamamelis virginiana*     | Witch Hazel                 | 12                  | 6-12                   | 0.25"           | Subcanopy | 4%         | FACU                                                                        |  |  |  |  |  |  |  |
| Euonymus americanus*      | American<br>Strawberry Bush | 12                  | 6-12                   | 0.25"           | Shrub     | 3%         | FAC                                                                         |  |  |  |  |  |  |  |
| Liriodendron tulipifera   | Tulip Tree                  | 12                  | 6-12                   | 0.25"           | Canopy    | 4%         | FACU                                                                        |  |  |  |  |  |  |  |
| Carya cordiformis         | Bitternut Hickory           | 12                  | 6-12                   | 0.25"           | Canopy    | 5%         | FACU                                                                        |  |  |  |  |  |  |  |
| * Subcanopy species - not | held to monitoring h        | eight requireme     | nts                    |                 |           |            | <sup>1</sup> Subcanopy species - not held to monitoring height requirements |  |  |  |  |  |  |  |

## Shaded Supplemental Planting

| Shaded Bare Roots       |                             |                     |                         |                      |           |            |                           |
|-------------------------|-----------------------------|---------------------|-------------------------|----------------------|-----------|------------|---------------------------|
| Species                 | Common Name                 | Max Spacing<br>(ft) | Indiv.<br>Spacning (ft) | Min. Caliper<br>Size | Stratum   | Percentage | Wetland<br>Indicator Code |
| Platanus occidentalis   | Sycamore                    | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 10%        | FACW                      |
| Carya cordiformis       | Bitternut Hickory           | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 5%         | FACU                      |
| Liriodendron tulipifera | Tulip Poplar                | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 5%         | FACU                      |
| Carpinus caroliniana*   | Ironwood                    | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 4%         | FAC                       |
| Diospyros virginiana    | Persimmon                   | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 10%        | FAC                       |
| Morus rubra*            | Red Mulberry                | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 5%         | FACU                      |
| Nyssa sylvatica         | Black Gum                   | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 5%         | FAC                       |
| Eunoymus americanus*    | American Strawberry<br>Bush | 25                  | 12-25                   | 0.25" - 1.0"         | Shrub     | 4%         | FAC                       |
| Calycanthus floridus*   | Sweetshrub                  | 25                  | 12-25                   | 0.25" - 1.0"         | Shrub     | 4%         | FACU                      |
| Hamamelis virginiana*   | Witch Hazel                 | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 7%         | FACU                      |
| Quercus rubra           | Northern Red Oak            | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 10%        | FACU                      |
| Fagus grandifolia       | American Beech              | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 5%         | FACU                      |
| Quercus alba            | White Oak                   | 25                  | 12-25                   | 0.25" - 1.0"         | Canopy    | 10%        | FACU                      |
| Lindera benzoin*        | Spicebush                   | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 4%         | FAC                       |
| Cornus florida*         | Flowering Dogwood           | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 5%         | FACU                      |
| Ozydendron arboreum*    | Sourwood                    | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 4%         | UPL                       |
| llex opaca*             | American Holly              | 25                  | 12-25                   | 0.25" - 1.0"         | Subcanopy | 3%         | FACU                      |

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| Pasture Seeding |                                 |               |                   |  |  |  |
|-----------------|---------------------------------|---------------|-------------------|--|--|--|
|                 | Pure Live Seeding (42 lbs/acre) |               |                   |  |  |  |
|                 | Species Name                    | Common Name   | Density (lbs/acre |  |  |  |
|                 | Dactylis qlomerata              | Orchard Grass | 20                |  |  |  |
|                 | Trifolium pratense              | Red Clover    | 5                 |  |  |  |
|                 | Trifolium repens                | Ladino Clover | 5                 |  |  |  |

### Soil Amendments Soil Amendments

| To Be Installed Prior to Subsoil Plowing - See Section 7.4 of<br>Specifications |                               |                 |  |  |
|---------------------------------------------------------------------------------|-------------------------------|-----------------|--|--|
| Zone                                                                            | Amendment                     | Rate (lbs/acre) |  |  |
| All planting areas                                                              | Humic Plus                    | 200             |  |  |
| Areas with >0.5 feet of<br>cut or fill                                          | Tennessee Brown<br>Phosphate* | 50              |  |  |
| to be applied in addition to Humic Plus                                         |                               |                 |  |  |

| Temporary Seeding |                                 |                             |  |  |
|-------------------|---------------------------------|-----------------------------|--|--|
|                   | Temporary Seeding and Mulo      | h                           |  |  |
| Approved Date     | Туре                            | Planting Rate<br>(Ibs/acre) |  |  |
|                   | Rye Grain (Secale cereale)      | 120                         |  |  |
| lan 1 May 1       | Ladino Clover                   | 5                           |  |  |
| Jan I - May I     | Crimson Clover                  | 5                           |  |  |
|                   | Straw Mulch                     | 4000                        |  |  |
|                   | German Millet (Setaria italica) | 50                          |  |  |
|                   | Ladino Clover                   | 5                           |  |  |
| Way 1 - Aug 15    | Crimson Clover                  | 5                           |  |  |
|                   | 4000                            | 4000                        |  |  |
|                   | Rye Grain (Secale cereale)      | 120                         |  |  |
| Aug 15 - Dec 31   | Crimson Clover                  | 5                           |  |  |
|                   | 4000                            | 4000                        |  |  |

# Pasture Seeding

| nporary Seeding and Mulch |     |
|---------------------------|-----|
|                           |     |
| Grain (Secale cereale)    | 120 |
| no Clover                 | 5   |
|                           |     |

## **Riparian Seeding**

















24-Hour Erosion Control Contact: Aaron Earley, PE Wildlands Engineering, Inc. 1430 S. Mint St., Suite 104 Charlotte, NC 28203 704-819-0848 Limits of Disturbance: 16.3 Acres Project ID: TBD

### Notes:

- The contractor shall maintain erosion and sediment control devices in accordance with the appropriate city and state erosion and sediment control ordinances.
- Ground stabilization shall must be established within 7 days on perimeter areas and slopes steeper than 3:1, and within 14 days on all other areas.
- The contractor shall prevent standing water due to construction.
  Disturbed areas shall be seeded and mulched at the discretion of the
- Engineer. 5. The contractor shall follow the erosion control measures as shown
- on sheets unless otherwise approved by the Engineer.
- 6. The contractor shall work in the dry at all locations. When required, pump around use shall be determined by the contractor based the construction sequence and Detail 3, Sheet 6.5.
- Straw wattles to be installed on an as needed basis along the top of the active stream channel banks where overland sediment is reaching the channel. This shall be directed by the engineer in the field.
- 8. All construction traffic to use crossings as show in plans.
  9. All wetlands outside of limits of disturbance and permitted impact
- areas shall be avoided.
  All disturbance within 25' of top of bank must be stabilized by the
- end of the day. 11. Efforts shall be made by the contractor to maintain a minimum
- Errors shall be made by the contractor to maintain a minimum distance of 25' between temporary stockpiles and proposed stream top of banks.
- 12. Spoil areas shall have slopes no steeper than 2:1.
- 13. Straw wattles shall be installed along top of stream banks to prevent sediment from disturbed upland areas from washing into streams.

TSHEET 5.

1025 1075 N/F JACK S. FLETCHER and wife, GLENDA KAYE H. FLETCHER D.B. 337, PG. 369 PIN: 5928-60-3034 N/F MONTY K: VENABLE ET AL. D.B. 205, RG. 495 – PIN: 5928-60-5518 VENABLE FARM ROAD 9900-99 T Pan TON B Delon gelon N/F N/F LU ANN VENABLE BROWNE D.B. 327, PG. 641 PIN: 5928-50-7069 CHARLES E. BROWNE & LU ANN VENABLE BROWN D.B. 1209, PG. 520 (TRACT 2) P.I.N. 5927-00-59-9301 N/F CHARLES E. BROWNE & LU ANN V. BROWN D.B. 525, PG. 330 P.I.N. 5927-49-7075 SIR .001 00 100-100 b07 901 VENABLE CREEK 101 THOF VENABLE CREEK Lan -00 N/F MONTY K. VENABLE ET AL. D.B. 313, PG. 722 PIN: 5927-68-4669 UT5 1100--N/F MONTY K. VENABLE ET AL. D.B. 313, PG. 722 PIN: 5927-68-4669 SHEET 5.5125 S -1150-IABLE CREEK URCH MOUNTAIN UTZA N/F MONTY LEE SIMPSON and wife, DELORES DAWN SIMPSON D.B. 720, PG. 914 SHEET 5. and UNRECORDED MAP BY UNRECORDED MAP BY ROBERT E. REIF, L-1516 C-368(E) c/o BOWMAN-BUNN, PC MT. AIRY, NC PIN: 5927-78-4648 N/F MICHAEL LEE VENABLE and wife, PHYLLIS ANN VENABLE D.B. 612, PG. 686 D.B. 585, PG. 703 PIN: 5927-67-1505 N/F RANDY DEAN VENABLE and wife, 1125 DAPHNE VENABLE D.B. 1164, PG. 942 P.B. 23, PG. 109 1150 and UNRECORDED MAPS BY UNRECORDED MAPS BY ROBERT E. REIF, L-1516 C-368(A), C-368(D), & C-998(B) c/o BOWMAN-BUNN, PC MT. AIRY, NC PIN: 5927-67-7679 1250 -1225 1200 \_\_\_\_\_\_\_ 15th




















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NOTES:

- 1. THE FENCE SHALL BE BUILT ACCORDING TO THE NRCS SPECIFICATION 382 FOR 5-STRAND ELECTRIC WIRE HIGH TENSILE FENCE. (APRIL 2008)
- WIRE SHALL BE 12.5 GAUGE, CLASS 3 GALVANIZED ZINC (ASTM-116 STANDARD) WITH 170,000 PSI TENSILE STRENGTH. WIRE SHALL BE INSTALLED ON THE LIVESTOCK SIDE OF THE FENCE.
   LINE POSTS SHALL BE 3.5" DIA. PRESSURE TREATED WOOD WITH A MAXIMUM SPACING OF 30 FEET AND A MINIMUM POST HEIGHT OF 68".
- 4.
- BRACE POSTS SHALL BE 4" DIA. DIAMETER AND SET 48" INTO THE GROUND. HORIZONTAL BRACE POSTS SHALL BE 2.5" DIA. GALVANIZED PIPE OR 4" DIA. PRESSURE TREATED WOOD.
- ATTACH WIRE TO POSTS USING THE INDUSTRY STANDARD CONNECTORS AND/OR HIGH QUALITY COMMERCIAL INSULATOR TO ALLOW FOR FUTURE ELECTRIFICATION.
   BRACING SHALL BE ACCORDING TO THE TABLE BELOW:

| PULL DISTANCE    | END/CORNER/GATE BRACE SPECIFICATION  | INLINE BRACE SPECIFICATION           |
|------------------|--------------------------------------|--------------------------------------|
| < 660 FEET       | SINGLE H OR SINGLE DIAGONAL ASSEMBLY | NOT REQUIRED                         |
| 660 - 2,000 FEET | SINGLE H OR SINGLE DIAGONAL ASSEMBLY | SINGLE H OR SINGLE DIAGONAL ASSEMBLY |
| > 2,000 FEET     | DOUBLE H OR DOUBLE DIAGONAL ASSEMBLY | SINGLE H OR SINGLE DIAGONAL ASSEMBLY |

7. REFER TO THE SPECIFICATIONS FOR MORE INFORMATION ON FENCING.

5-Wire High Tensile Fence



#### GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

mplementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The ermittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet nay not apply depending on site conditions and the delegated authority having jurisdiction

# SECTION E: GROUND STABILIZATION

| Required Ground Stabilization Timeframes |                                                              |                                                                                  |                                                                                                                                                                                                              |
|------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site Area Description                    |                                                              | Stabilize within this<br>many calendar<br>days after ceasing<br>land disturbance | Timeframe variations                                                                                                                                                                                         |
| (a)                                      | Perimeter dikes,<br>swales, ditches, and<br>perimeter slopes | 7                                                                                | None                                                                                                                                                                                                         |
| (b)                                      | High Quality Water<br>(HQW) Zones                            | 7                                                                                | None                                                                                                                                                                                                         |
| (c)                                      | Slopes steeper than 3:1                                      | 7                                                                                | If slopes are 10' or less in length and are<br>not steeper than 2:1, 14 days are<br>allowed                                                                                                                  |
| (d)                                      | Slopes 3:1 to 4:1                                            | 14                                                                               | -7 days for slopes greater than 50' in<br>length and with slopes steeper than 4:1<br>-7 days for perimeter dikes, swales,<br>ditches, perimeter slopes and HQW<br>Zones<br>-10 days for Falls Lake Watershed |
| (e)                                      | Areas with slopes flatter than 4:1                           | 14                                                                               | <ul> <li>-7 days for perimeter dikes, swales,<br/>ditches, perimeter slopes and HQW Zones</li> <li>-10 days for Falls Lake Watershed unless<br/>there is zero slope</li> </ul>                               |

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieve

# GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the echniques in the table below

| Temporary Stabilization                                        | Permanent Stabilization                                             |
|----------------------------------------------------------------|---------------------------------------------------------------------|
| <ul> <li>Temporary grass seed covered with straw or</li> </ul> | <ul> <li>Permanent grass seed covered with straw or</li> </ul>      |
| other mulches and tackifiers                                   | other mulches and tackifiers                                        |
| <ul> <li>Hydroseeding</li> </ul>                               | <ul> <li>Geotextile fabrics such as permanent soil</li> </ul>       |
| <ul> <li>Rolled erosion control products with or</li> </ul>    | reinforcement matting                                               |
| without temporary grass seed                                   | <ul> <li>Hydroseeding</li> </ul>                                    |
| <ul> <li>Appropriately applied straw or other mulch</li> </ul> | <ul> <li>Shrubs or other permanent plantings covered</li> </ul>     |
| <ul> <li>Plastic sheeting</li> </ul>                           | with mulch                                                          |
|                                                                | <ul> <li>Uniform and evenly distributed ground cover</li> </ul>     |
|                                                                | sufficient to restrain erosion                                      |
|                                                                | Structural methods such as concrete, asphalt or                     |
|                                                                | retaining walls                                                     |
|                                                                | <ul> <li>Rolled erosion control products with grass seed</li> </ul> |

#### POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

- 1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the NC DWR List of Approved PAMS/Flocculants.
- Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
- 3. Apply flocculants at the concentrations specified in the NC DWR List of Approved PAMS/Flocculants and in accordance with the manufacturer's instructions.
- 4. Provide ponding area for containment of treated Stormwater before discharging offsite.
- 5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

# EQUIPMENT AND VEHICLE MAINTENANCE

- 1. Maintain vehicles and equipment to prevent discharge of fluids.
- 2. Provide drip pans under any stored equipment
- 3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
- 4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
- Remove leaking vehicles and construction equipment from service until the problem has been corrected.
- Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials

# LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

- 1. Never bury or burn waste. Place litter and debris in approved waste containers. 2. Provide a sufficient number and size of waste containers (e.g dumpster, trash
- receptacle) on site to contain construction and domestic wastes.
- Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available
- Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
- Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
- Anchor all lightweight items in waste containers during times of high winds.
- 7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
- Dispose waste off-site at an approved disposal facility.
- On business days, clean up and dispose of waste in designated waste containers.

#### PAINT AND OTHER LIQUID WASTE

- 1. Do not dump paint and other liquid waste into storm drains, streams or wetlands. 2. Locate paint washouts at least 50 feet away from storm drain inlets and surface
- waters unless no other alternatives are reasonably available.
- Contain liquid wastes in a controlled area.
- Containment must be labeled, sized and placed appropriately for the needs of site. 4.
- 5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

#### PORTABLE TOILETS

- 1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
- Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas
- 3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

#### EARTHEN STOCKPILE MANAGEMENT

- 1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
- Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
- 3. Provide stable stone access point when feasible
- Stabilize stockpile within the timeframes provided on this sheet and in accordance 4. with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.



## CONCRETE WASHOUTS

- Do not discharge concrete or cement slurry from the site.
- 2. and state solid waste regulations and at an approved facility.
- Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
- 4. Install temporary concrete washouts per local requirements, where applicable. If a alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
- Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
- Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum. install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
- 7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority
- Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
- 9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
- in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

## HERBICIDES, PESTICIDES AND RODENTICIDES

- 1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
- Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
- Do not store herbicides, pesticides and rodenticides in areas where flooding is 3. possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
- Do not stockpile these materials onsite.

#### HAZARDOUS AND TOXIC WASTE

- 1. Create designated hazardous waste collection areas on-site
- 2. Place hazardous waste containers under cover or in secondary containment.
- NCG01 GROUND STABILIZATION AND MATERIALS HANDLING
  - Ground Stabilization and Materials Handling

Dispose of, or recycle settled, hardened concrete residue in accordance with local

10. At the completion of the concrete work, remove remaining leavings and dispose of

Do not store hazardous chemicals, drums or bagged materials directly on the ground

EFFECTIVE: 04/01/19



#### PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

#### SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

| Inspect                                                                  | (during normal<br>business hours)                                                                                | Inspection records must include:                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (1) Rain gauge<br>maintained in<br>good working<br>order                 | Daily                                                                                                            | Daily rainfall amounts.<br>If no daily rain gauge observations are made during weekend<br>holiday periods, and no individual-day rainfall information<br>available, record the cumulative rain measurement for those u<br>attended days (and this will determine if a site inspection<br>needed). Days on which no rainfall occurred shall be recorded<br>"zero." The permittee may use another rain-monitoring devi<br>approved by the Division.                                |
| (2) E&SC<br>Measures                                                     | At least once per<br>7 calendar days<br>and within 24<br>hours of a rain<br>event $\geq$ 1.0 inch in<br>24 hours | 1. Identification of the measures inspected,     2. Date and time of the inspection,     3. Name of the person performing the inspection,     4. indication of whether the measures were operating     properly,     5. Description of maintenance needs for the measure,     6. Description, evidence, and date of corrective actions taken.                                                                                                                                    |
| (3) Stormwater<br>discharge<br>outfalls (SDOs)                           | At least once per<br>7 calendar days<br>and within 24<br>hours of a rain<br>event $\geq$ 1.0 inch in<br>24 hours | 1. identification of the discharge outfalls inspected,     2. Date and time of the inspection,     3. Name of the person performing the inspection,     4. Evidence of indicators of stormwater pollution such as oil     sheen, floating or suspended solids or discoloration,     5. Indication of visible sediment leaving the site,     6. Description, evidence, and date of corrective actions taken,                                                                      |
| (4) Perimeter of<br>site                                                 | At least once per<br>7 calendar days<br>and within 24<br>hours of a rain<br>event $\geq$ 1.0 inch in<br>24 hours | If visible sedimentation is found outside site limits, then a record<br>of the following shall be made:<br>1. Actions taken to deen up or stabilize the sediment that has le<br>the site limits,<br>2. Description, evidence, and date of corrective actions taken, an<br>3. An explanation as to the actions taken to control future<br>releases.                                                                                                                               |
| (5) Streams or<br>wetlands onsite<br>or offsite<br>(where<br>accessible) | At least once per<br>7 calendar days<br>and within 24<br>hours of a rain<br>event $\geq$ 1.0 inch in<br>24 hours | If the stream or wetland has increased visible sedimentation or a<br>stream has visible increased lurbidity from the construction<br>activity, then a record of the following shall be made:<br>1. Description, evidence and date of corrective actions taken, an<br>2. Records of the required reports to the appropriate Division<br>Regional Office per Part III, Section C, Item (2)(a) of this permit<br>of this permit.                                                    |
| (6) Ground<br>stabilization<br>measures                                  | After each phase<br>of grading                                                                                   | <ol> <li>The phase of grading (installation of perimeter E&amp;SC<br/>measures, clearing and grubbing, installation of storm<br/>drainage facilities, completion of all land-disturbing<br/>activity, construction or redevelopment, permanent<br/>ground cover).</li> <li>Documentation that the required ground stabilization<br/>measures have been provided within the required<br/>timeframe or an assurance that they will be provided as<br/>soon as possible.</li> </ol> |

#### PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

# SECTION B: RECORDKEEPING

#### 1. E&SC Plan Docume

# The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be documented in the manner described:

| Item to Document                                                                                                                                                             | Documentation Requirements                                                                                                                                                                                                                                                                                                                                   |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| (a) Each E&SC Measure has been installed<br>and does not significantly deviate from the<br>locations, dimensions and relative elevations<br>shown on the approved E&SC Plan. | Initial and date each E&SC Measure on a copy<br>of the approved E&SC Plan or complete, date<br>and sign an inspection report that lists each<br>E&SC Measure shown on the approved E&SC<br>Plan. This documentation is required upon the<br>initial installation of the E&SC Measures or if<br>the E&SC Measures are modified after initial<br>installation. |  |
| (b) A phase of grading has been completed.                                                                                                                                   | Initial and date a copy of the approved E&SC<br>Plan or complete, date and sign an inspection<br>report to indicate completion of the<br>construction phase.                                                                                                                                                                                                 |  |
| (c) Ground cover is located and installed<br>in accordance with the approved E&SC<br>Plan.                                                                                   | Initial and date a copy of the approved E&SC<br>Plan or complete, date and sign an inspection<br>report to indicate compliance with approved<br>ground cover specifications.                                                                                                                                                                                 |  |
| (d) The maintenance and repair<br>requirements for all E&SC Measures<br>have been performed.                                                                                 | Complete, date and sign an inspection report.                                                                                                                                                                                                                                                                                                                |  |
| (e) Corrective actions have been taken<br>to E&SC Measures.                                                                                                                  | Initial and date a copy of the approved E&SC<br>Plan or complete, date and sign an inspection<br>report to indicate the completion of the<br>corrective action.                                                                                                                                                                                              |  |

## 2. Additional Documentation

In addition to the E&SC Plan documents above, the following items shall be kept on the site and available for agency inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This general permit as well as the certificate of coverage, after it is received.

- (b) Records of inspections made during the previous 30 days. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records
- (c) All data used to complete the Notice of Intent and older inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

#### PART III SELF-INSPECTION, RECORDKEEPING AND REPORTING

# SECTION C: REPORTING

- . Occurrences that must be reported Permittees shall report the following occurrences:
- (a) Visible sediment deposition in a stream or wetland.
- (b) Oil spills if:
- They are 25 gallons or more,
- They cause sheen on surface waters (regardless of volume), or
  - They are within 100 feet of surface waters (regardless of volume).

  - the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.
  - (b) Anticipated bypasses and unanticipated bypasses.
  - (c) Noncompliance with the conditions of this permit that may endanger health or the environment

## . Reporting Timeframes and Other Requirements

appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Division's Emergency Response personnel at (800) 662-7956, (800) 858-0368 or (919) 733-3300.

| Occurrence          | Reporting Timeframes (After Discovery                     |
|---------------------|-----------------------------------------------------------|
| a) Visible sediment | • Within 24 hours, an oral or electroni                   |
| leposition in a     | • Within 7 calendar days, a report tha                    |
| tream or wetland    | sediment and actions taken to addre                       |
|                     | Division staff may waive the requirer                     |
|                     | case-by-case basis.                                       |
|                     | <ul> <li>If the stream is named on the NC 303</li> </ul>  |
|                     | related causes, the permittee may be                      |
|                     | monitoring, inspections or apply mor                      |
|                     | determine that additional requireme                       |
|                     | with the federal or state impaired-wa                     |
| b) Oil spills and   | • Within 24 hours, an oral or electronic                  |
| elease of           | shall include information about the o                     |
| azardous            | location of the spill or release.                         |
| ubstances per Item  |                                                           |
| .(b)-(c) above      |                                                           |
| c) Anticipated      | <ul> <li>A report at least ten days before the</li> </ul> |
| ypasses [40 CFR     | The report shall include an evaluatio                     |
| .22.41(m)(3)]       | effect of the bypass.                                     |
| d) Unanticipated    | <ul> <li>Within 24 hours, an oral or electroni</li> </ul> |
| ypasses [40 CFR     | <ul> <li>Within 7 calendar days, a report that</li> </ul> |
| .22.41(m)(3)]       | quality and effect of the bypass.                         |
| e) Noncompliance    | • Within 24 hours, an oral or electroni                   |
| vith the conditions | • Within 7 calendar days, a report that                   |
| of this permit that | noncompliance, and its causes; the p                      |
| nay endanger        | including exact dates and times, and                      |
| ealth or the        | been corrected, the anticipated time                      |
| nvironment[40       | continue; and steps taken or planned                      |
| CFR 122.41(l)(7)]   | prevent reoccurrence of the noncom                        |
|                     | <ul> <li>Division staff may waive the requirer</li> </ul> |
|                     | case-by-case basis.                                       |
|                     |                                                           |

# NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

Self-inspection, Recordkeeping and Reporting











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