

Stream A



Stream E



Stream H



Stream L



Stream N



Stream S- Thicketty Creek



Wetland B



Stream T



Pond



Stream Q- Pacolet River



Stream Z



Stream AA



Stream AE- Abingdon Creek



Stream AJ



Stream AO



Wetland B



Stream AU



Stream BD



Wetland C



Stream BP- Quinton Branch



Stream BS- Service Branch



Wetland G



Stream BY



Stream CA



Stream CD



Stream CB- Gilkey Creek



Stream CH



Wetland I



Wetland J



Wetland K



Stream CK



Stream CO



Stream CR



Stream CW- Thicketty Creek



Wetland Q



Wetland T



Stream DG



Stream DJ- Fanning Creek

APPENDIX B DATA FORMS

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APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.914278° N. Long. -81.568320° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \boxtimes Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- $\overline{\boxtimes}$ Field Determination. Date(s): 4/8/09 to 4/29/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- П Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 11812.6 linear feet: 1-20 width (ft) and/or acres. Wetlands: acres
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known): variable.
- Non-regulated waters/wetlands (check if applicable):³ 2.
 - Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: Nexus to TNW is variable.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally"

(e.g., typically 3 months).

Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions: Watershed size: Variable Pick List Drainage area: Variable Pick List Average annual rainfall: 49.5 inches Average annual snowfall: N/A inches
- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>
 Tributary flows directly into TNW.
 - Tributary flows through $\frac{1}{2}$ tributaries before entering TNW.

Project waters are 10-15 river miles from TNW. Project waters are 1-2 river miles from RPW. Project waters are 5-10 aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Variable. Tributary stream order, if known: first order.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and crosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) <u>General Tributary Characteristics (check all that apply)</u>:

Tributary is:	⊠ Natural
	Artificial (man-made). Explain:
	Manipulated (man-altered). Explain
Tributary prope Average wi	erties with respect to top of bank (estimate): dth: Variable feet

11101460		variable leet
Average	depth:	Variable feet
Average	side slo	opes: 3:1].

Primary tributary substrate composition (check all that apply):

Silts	🔀 Sands
Cobbles	🖾 Gravel
Bedrock	Vegetation. Type/% cover:
Other. Explain:	

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Smaller tributaries with flatter gradients and banks in which vegetation is present typically showed more stability. Deeply incised headwater channels were typically highly eroded and less stable.

Concrete

Presence of run/riffle/pool complexes. Explain: Most first order tributaries within the project area show characteristics of small headwater channels with minimum to no flow. Run/riffle pool complexes are very minimal within the 1st order streams.

Tributary geometry: Meandering

Tributary gradient (approximate average slope): Variable %

(c) <u>Flow:</u>

Tributary provides for: Seasonal flow

Estimate average number of flow events in review area/year: 6-10

Describe flow regime: Tributaries range from natural channels formed by steep gradients collecting runoff to tributaries manipulated by livestock that drain adjacent cattle pastures and agricultural land.

Other information on duration and volume:

Surface flow is: Pick List. Characteristics: Surface flow is variable.

Subsurface flow: Yes. Explain findings: Specific features within the project area showed signs of subsurface flow.

Tributary has (check all that apply):

OHWM ⁶ (check all indicators that apply):		
its		

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

High Tide Line indicated by:	Mean High Water Mark indicated by:
oil or scum line along shore objects	survey to available datum;
fine shell or debris deposits (foreshore)	physical markings;
physical markings/characteristics	vegetation lines/changes in vegetation types.
tidal gauges	
other (list):	

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water apperance is variable.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

Identify specific pollutants, if known: Manure was observed several tributaries at the time of the survey and other agricultural pollutants, such as fetilizers, are potentially present.

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(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width): Riparian corridors range from 10-100 feet.
- Wetland fringe. Characteristics: aries were identified..
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW 2.

Physical Characteristics: (i)

- (a) General Wetland Characteristics:
 - Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain: .

> Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) <u>Wetland_Adjacency Determination with Non-TNW:</u>
 - Directly abutting
 - □ Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:
 Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW Project wetlands are Pick List river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The identified first order tributaries have minimal flow classified as seasonal to intermittent flow (inundated <5 to 20% of the time during the growing(COE 1987)). Due to a lack of flow, first order tributaries within the project area are unlikely to support the transport of nutrients and organic carbon vital to food webs to downstream tributaries. Similarily, the tributaries are unlikely to support the spawning or life stages of aqautic species due to a lack of pool/riffle/run complexes and ideal substrate/canopy cover. The tributaries and associated wetlands are able to provide limite storage for flood water during high precipitation events particular those wetlands that are located within lower elevation floodplains. Additionally, the tributaries can act a filter for runoff and pollutants from adjacent agricultural land before it is able to flow into the downstream reaches of the nearest TNW (COE 2007).</p>
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres

Identify type(s) of waters:

Non-RPWs⁸ that flow directly or indirectly into TNWs. 3.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: 11812.6 linear feet 1-20width (ft).
 - - Identify type(s) of waters:

Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. 4.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
- S Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- 🔣 Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - 2 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).

ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, E. DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

	 which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce. which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	 Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	 NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):
	Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: . Wetlands: acres.
	 Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
<u>SEC</u>	CTION IV: DATA SOURCES.
A. 5	SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Data sheets prepared/submitted by or on behalf of the applicant/consultant: Office concurs with data sheets/delineation report. Office does not concur with data sheets/delineation report. Data sheets prepared by the Corps: Corps navigable waters' study: U.S. Geological Survey Hydrologic Atlas: USGS NHD data. USGS NHD data. USSDA Natural Resources Conservation Service Soil Survey. Citation: National wetlands inventory map(s). Cite name: State/Local wetland inventory map(s): FEMA/FIRM maps: 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929) Photographs: A Aerial (Name & Date): Duke Energy Carolinas, LLC 2008. or Other (Name & Date):
	 National wetlands inventory map(s). Cite name: State/Local wetland inventory map(s): FEMA/FIRM maps: 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929) Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008. or Other (Name & Date): Previous determination(s). File no. and date of response letter:

Applicable/supporting case law:
 Applicable/supporting scientific literature:
 Other information (please specify):

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B. ADDITIONAL COMMENTS TO SUPPORT JD:

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O- East Route**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N. Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) Into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - 4 TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 8518.7 linear feet: width (ft) and/or acres. Wetlands: 0.01 acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known): Variable.
- Non-regulated waters/wetlands (check if applicable):³ 2.
 - Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. \boxtimes Explain: Nexus to TNW is variable.

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions: Watershed size: Variable Pick List Drainage area: Variable Pick List Average annual rainfall: 49.5 inches Average annual snowfall: NA inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>
 ☑ Tributary flows directly into TNW.
 ☑ Tributary flows through <u>2</u> tributaries before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are 1 (or less) river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Routes to Broad River within the project boundary are variable. Tributary stream order, if known: Second Order.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	Tributary is: X Natural
	Manipulated (man-altered). Explain:
	Tributary properties with respect to top of bank (estimate): Average width: 3-15 feet Average depth: Variable feet Average side slopes: 3:1].
	Primary tributary substrate composition (check all that apply):
	Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Stability and condition varies with each identifed tributary. Presence of run/riffle/pool complexes. Explain: Riffle pools were observed during the survey however, the presence ar amount of riffle pool complexes varies. Tributary geometry: <u>Meandering</u> Tributary gradient (approximate average slope): variable %
(c)	<u>Flow:</u> Tributary provides for: Seasonal flow Estimate average number of flow events in review area/year: 20 (or greater) Describe flow regime: Typical second order streams within the project boundary have seasonal or intermittent flow Other information on duration and volume:
	Surface flow is: Pick List . Characteristics: Surface flow is variable.
	Subsurface flow: Yes. Explain findings: Subsurface flow was observed at several tributaries, usually with the flow resurfacing downstream.
	Tributary has (check all that apply):
	If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
Ch Ch	emical Characteristics: aracterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water appearnce varies.

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⁶A natural the OHW regime (e. ⁷Ibid.

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(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width): 10-100 ft.
- Wetland fringe. Characteristics:
- \boxtimes Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings: While the presence of habitat varies, observed riffle pools and intermittent to perennial flow can provide habitat for aquatic species, such as amphibians, insects, and macroinvertebrates.

Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW 2.

Physical Characteristics: (i)

(a) General Wetland Characteristics:

Properties:

Wetland size:0.01 acres

Wetland type. Explain: PFO .

Wetland quality. Explain: Clear water and no known polluntants observed . Project wetlands cross or serve as state boundaries. Explain:

General Flow Relationship with Non-TNW: (b) Flow is: Ephemeral flow. Explain: Low volume and slow flow were observed.

Surface flow is: Discrete and confined Characteristics: Flow is within a defined channel...

Subsurface flow: No. Explain findings: Dye (or other) test performed:

Wetland Adjacency Determination with Non-TNW: (c)

Directly abutting

Not directly abutting

Discrete wetland hydrologic connection. Explain:

Ecological connection. Explain:

Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are 5-10 river miles from TNW. Project waters are $\overline{2-5}$ aerial (straight) miles from TNW. Flow is from: No Flow. Estimate approximate location of wetland as within the 5 - 10-year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Water color is clear with no known polluntants. Wetland is located adjacent to tributary SAZ with riparian corridor of >100 feet.

Identify specific pollutants, if known: None.

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): Forested >100 ft.
- Vegetation type/percent cover. Explain:
- Habitat for:

 - Federally Listed species. Explain findings:
 Fish/spawn areas. Explain findings:
 Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: Capable of supporting limited aquatic species.

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Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: 1 Approximately (0.01) acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Y Size (in acres) 0.01 Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed: The wetland associated with the 2nd order tributaries within the project area is classified PFO and totals 0.01 acres. The wetlands meets the 3 defining parameters described in the 1987 US Army Corps of Engineers Wetland Delineation Manual and has a direct hydrologic connection with the associated tributary providing additional storage of flood water. In general, wetlands can act as a filter for sediment and runoff before it reaches larger tributaries downstream. Wetlands that are abutting streams also have the capability to deliver nutrients to the associated tributary. Biological functions within this wetland includes providing minimal habitat for aquutic species of insects and amphibians.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The identified second order tributaries have flow classified as seasonal to perennial capable of supporting the transport of nutrients and organic carbon vital to food webs to downstream tributaries. Similarily, the tributaries are able to support the spawning or life stages of aqautic species within the areas in which lack of pool/riffle/run complexes and ideal substrate/canopy cover is present. The tributaries and associated wetlands are able to provide storage for flood water during high precipitation events, particular those wetlands that are located within lower elevation floodplains. Additionally, the tributaries can act a filter for runoff and pollutants from adjacent agricultural land before it is able to flow into the downstream reaches of the nearest TNW (COE 2007).
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:

Č.	TNWs:	linear feet	width (ft), Or,	acres.
4	Wetlands	adjacent to TNWs:	acres.	

- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Specific tributaries exhibited flowing water during the growing season and greater than 48 hours since last rainfall.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

acres.

- Tributary waters: 8518.7 linear feet 3-15width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:
- 4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Fringe wetland which has a direct hydrologic connection to the tributary.
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.01 acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 - Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.
 - / Provide estimates for jurisdictional wetlands in the review area: acres.
- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E.	ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): ¹⁰ which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce. which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	 Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	 NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):
	Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, streams): Image: Sole potential basis of jurisdiction is the MBR factors (i.e., rivers, stream
	 Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet, width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
<u>SE</u>	CTION IV: DATA SOURCES.
А.	 SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with data sheets/delineation report. Office does not concur with data sheets/delineation report. Data sheets prepared by the Corps: Corps navigable waters' study:

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- U.S. Geological Survey Hydrologic Atlas:
- 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:
 USDA Natural Resources Conservation Service Soil Survey. Citation:
 National wetlands inventory map(s). Cite name:
 State/Local wetland inventory map(s):

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¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.
- FEMA/FIRM maps:
 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008. or Other (Name & Date):
 Previous determination(s). File no. and date of response letter:

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Applicable/supporting case law: Applicable/supporting scientific literature: Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

See attached table for indiviual stream and wetland data.

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APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O - Abingdon Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

Office (Desk) Determination. Date:

 $\overline{\mathbf{N}}$ Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

- a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
- b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 510.9 linear feet: 27 width (ft) and/or acres. Wetlands: NA acres.
- c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.
 - Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally"

(e.g., typically 3 months).

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>
 Tributary flows directly into TNW.
 Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List. Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris clear, natural line impressed on the bank the presence of litter and debris changes in the character of soil destruction of terrestrial vegetation shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Cha	emical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW 2.

Physical Characteristics: (i)

- (a) General Wetland Characteristics: Properties: Wetland size: acres
 - Wetland type. Explain: Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

> Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:

 - Separated by berm/barrier. Explain:

(d) <u>Proximity (Relationship) to TNW</u>

Project wetlands are **Pick: List** river miles from TNW. Project waters are Pick List aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Identify specific pollutants, if known:

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(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): П
- Vegetation type/percent cover. Explain: \Box
- $\overline{\Box}$ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. **RPWs that flow directly or indirectly into TNWs.**
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Abingdon Creek is a large bed and bank perennial stream with well defined stream morphology, including a good riffle-pool sequence, substrate sorting, and an active floodplain.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: **510.9** linear feet **27** width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:
- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.

- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

- which are or could be used by interstate or foreign travelers for recreational or other purposes.
- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain:
- Other factors. Explain:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identif	y water bod	y and summarize	rationale sur	porting	determination:

- Provide estimates for jurisdictional waters in the review area (check all that apply):
- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres
- Identify type(s) of waters:
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- 🔝 If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
- Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- \Box Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

- \square
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- 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:
 - USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- \boxtimes Photographs: 🛛 Aerial (Name & Date):Duke Energy Carolinas, LLC 2008.
 - or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law: . 4
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Abingdon Creek is a named USGS stream with perennial flow. Some bank failure was observed within the Project boundary. This stream empties into the Broad River approximately 0.7 river mile from the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O - Pacolet River**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 $\overline{\boxtimes}$ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

Office (Desk) Determination. Date:

Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - <u>an con xa</u> Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 236.8 linear feet: 35 width (ft) and/or acres. Wetlands: NA acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.

Detentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS.

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions: Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches
- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: . Presence of run/riffle/pool complexes. Explain: . Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List. Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining OHWM ⁷ Emploin
		Discontinuous OHWM.' Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: Mean High Water Mark indicated by: oil or scum line along shore objects survey to available datum; fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Chai Iden	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: tify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) <u>General Wetland Characteristics:</u> Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
- (b) <u>General Flow Relationship with Non-TNW</u>: Flow is: <u>Pick Eist</u>. Explain:

Surface flow is: <u>Pick List</u> Characteristics:

Subsurface flow: **Pick List**. Explain findings: Dye (or other) test performed:

(c) <u>Wetland Adjacency Determination with Non-TNW:</u>

Directly abutting

Not directly abutting

- Discrete wetland hydrologic connection. Explain:
- Ecological connection. Explain:
- Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: **Pick List**. Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
 - Vegetation type/percent cover. Explain:
- Vegetation tHabitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.

2. RPWs that flow directly or indirectly into TNWs.

- Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Stream is a USGS named bed and bank perennial channel (Pacolet River). This waterbody has year-round flow.
- Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 236 .8 linear feet 35 width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Evidence of drainage through a direct hydrologic connection.
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: NAacres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).

- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain:
- Other factors. Explain:

E. ISOLATED (INTERSTATE OR INTRA-STATE) WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

which are or could be used by interstate or foreign travelers for recreational or other purposes.

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres
- Identify type(s) of waters:
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
 - Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- 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:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: X Aerial (Name & Date):Duke Energy Carolinas, 2008.
 - or 🗌 Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The Pacolet River is a fourth order stream or larger with a large watershed. It
crosses into the Project boundary near the confluence with the Broad River, approximately 3.4 river miles. No jurisdictional wetlands are
associated with this stream within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O- Quinton Branch**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- 1 Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - <u>.</u> TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 1601.6 linear feet: 20 width (ft) and/or acres. Wetlands: 0.38 acres.
 - c. Limits (boundaries) of jurisdiction based on: 1987 Delineation Manual Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions:
 - Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches
- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 - Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: . Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: Pick List Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: PickList. Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris changes in the character of soil the presence of litter and debris shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour water staining multiple observed or predicted flow events other (list): biscontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Chai Iden	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: tify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

Riparian corridor. Characteristics (type, average width):

Wetland fringe. Characteristics:

- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: (i)

(a) General Wetland Characteristics:

Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

> Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting Not directly abutting

- Discrete wetland hydrologic connection. Explain:
- Ecological connection. Explain:
- Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:

Federally Listed species. Explain findings:

- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:
- Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. **RPWs that flow directly or indirectly into TNWs.**
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: USGS Named Perennial Stream.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

acres

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:
- 3. Non-RPWs⁸ that flow directly or indirectly into TNWs.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Evidence observed of direct drainage into Quinton Branch via ephemeral channels.
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.38 acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

- As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - From which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - Interstate isolated waters. Explain:
 - Other factors. Explain:

Identify water body and summarize rationale supporting determination:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: line Other non-wetland waters: linear feet width (ft).

acres.

Identify type(s) of waters:

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

Ē. Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): 4 linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- 7 Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: 2.1 acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant. Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- 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:
- USDA Natural Resources Conservation Service Soil Survey, Citation:
- Ē National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- \square Photographs: X Aerial (Name & Date):Duke Energy Carolinas, 2008.
- or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- 1 Applicable/supporting scientific literature:
- 2 Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Quiton Branch is a named perennial channel on the most current USGS Quad. High flow was observed within the channel greater than 48 hours since the previous precipitation. Abutting wetland met the three parameter criteria described within the 1987 Wetland Delination Guide. A significant nexus was observed between the wetland and Quiton Branch, e.g., ephemeral channels draining directly from the wetland to stream.

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line Project Route O - Thicketty Creek

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

- \boxtimes Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY);

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick-List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - 2 Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 270.2 linear feet: ~100 width (ft) and/or acres. Wetlands: NA acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):

2. Non-regulated waters/wetlands (check if applicable):³

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

 Watershed size:
 Pick List

 Drainage area:
 Pick List

 Average annual rainfall:
 inches

 Average annual snowfall:
 inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u> Tributary flows directly into TNW.

Tributary flows through **Pick** List tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

,	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply):
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	Flow: Tributary provides for: Pick List Estimate average number of flow events in review area/year: Pick Eist Describe flow regime: Other information on duration and volume:
		Surface flow is: PickEist. Characteristics:
		Subsurface flow: Pick List. Explain findings:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris clear, natural line impressed on the bank the presence of litter and debris changes in the character of soil destruction of terrestrial vegetation shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour water staining multiple observed or predicted flow events other (list): biscontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Cha	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

- (a) General Wetland Characteristics: Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
- (b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:

 - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
 - Vegetation type/percent cover. Explain:
- $\overline{\Box}$ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. <u>RPWs that flow directly or indirectly into TNWs.</u>
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Thicketty Creek is a named USGS stream. This stream has year-round flow, a large active floodplain, and a large watershed. Fish were observed within the channel.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - Interstate isolated waters. Explain:
 - Other factors. Explain:
- ⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
- Identify type(s) of waters:
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based <u>solely</u> on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Office concurs with data sheets/delineation report.
- Office does not concur with data sheets/delineation report.
- 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:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date):Duke Energy Carolinas, 2008.
 - or 🗌 Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Thicketty Creek enters the Project boundary approximately 1.4 river miles from its confluence with the Broad River. Although it has a large active floodplain, no jurisdictional wetlands were observed within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route O- First Order Tributaries**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° N. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \boxtimes Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- \boxtimes Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 8175.70 linear feet: 2-15 width (ft) and/or acres. Wetlands: 1.56 acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):< 1 foot.
- 2. Non-regulated waters/wetlands (check if applicable):³
 - Detentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain: Nexus to TNW is variable.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally"

(e.g., typically 3 months).

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions: Watershed size: Variable <u>Pick List</u> Drainage area: Variable <u>Pick List</u> Average annual rainfall: 49.75 inches Average annual snowfall: N/A inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>

☐ Tributary flows directly into TNW. ☑ Tributary flows through tributaries before entering TNW.

Project waters are **10-15** river miles from TNW. Project waters are **1-2** river miles from RPW. Project waters are **5-10** aerial (straight) miles from TNW. Project waters are **1-(or less)** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: N/A. Tributary stream order, if known: First Order.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) <u>General Tributary Characteristics (check all that apply)</u>:

I FIDULARY 1S:	🛆 Natural
-	Artificial (man-made). Explain:
	Manipulated (man-altered). Explain:
Tributary prope	rties with respect to top of bank (estimate):
Average wid	ith: 2-15 feet
Average dep	oth: Variable feet
Average side	e slopes: 3:1].
Primary tributary	substrate composition (check all that apply):
Silts	Sands
🛛 Cobbles	🔀 Gravel
Bedrock	Vegetation. Type/% cover.
Other. E:	xplain:
	-

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Smaller tributaries with flatter gradients and banks in which vegetation is present typically showed more stability. Deeply incised headwater channels were typically highly eroded and less stable.

Concrete

Presence of run/riffle/pool complexes. Explain: Most first order tributaries within the project area show characteristics of small headwater channels with minimum to no flow. Run/riffle pool complexes are very minimal within the 1st order streams.

Tributary geometry: Meandering

Tributary gradient (approximate average slope): 0-30 %

(c) <u>Flow:</u>

Tributary provides for: Seasonal flow

Estimate average number of flow events in review area/year: 2-5

Describe flow regime: Tributaries range from natural channels formed by steep gradients collecting runoff to tributaries manipulated by livestock that drain adjacent cattle pastures and agricultural land.

Other information on duration and volume:

Surface flow is: Pick List. Characteristics: Surface flow is variable .

Subsurface flow: Yes. Explain findings: Specific features within the project area showed signs of subsurface flow. Dye (or other) test performed:

Tributary has (check all that apply):

Bed and banks		
$\overline{\mathbf{X}}$ OHWM ⁶ (check all indicators that apply):		
clear, natural line impressed on the bank	\boxtimes	the presence of litter and debris
Changes in the character of soil		destruction of terrestrial vegetation
shelving	\boxtimes	the presence of wrack line
vegetation matted down, bent, or absent		sediment sorting
leaf litter disturbed or washed away	\boxtimes	scour
Sediment deposition		multiple observed or predicted flow events
water staining		abrupt change in plant community
other (list):		
Discontinuous OHWM. ⁷ Explain:		
If factors other than the OHWM were used to determin	ne la	teral extent of CWA jurisdiction (check all that apply):
High Tide Line indicated by:	Mea	an High Water Mark indicated by:

 -	Ų	-
oil or scum line along shore objects	survey to available datum;	
fine shell or debris deposits (foreshore)	physical markings;	
physical markings/characteristics	vegetation lines/changes in v	egetation types.
tidal gauges		
other (list):		

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water quality varies..

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

Identify specific pollutants, if known: Manure was observed in several tributaries at the time of the survey and other agricultural pollutants, such as fetilizers, are potentially present.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width): Riparian corridors range from 10-100 feet.
- Wetland fringe. Characteristics: Small wetlands or wetland seeps associated with tributaries were identified.. Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: **(i)**

(a) General Wetland Characteristics:

Properties: Wetland size: 1.56 acres Wetland type. Explain: Palustrine Emergent (PEM) and Palestrina Scrub-Shrub (PSS). Wetland quality. Explain: . Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: No Flow. Explain:

> Surface flow is: Not present Characteristics:

Subsurface flow: No. Explain findings: Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting □ Not directly abutting

- Discrete wetland hydrologic connection. Explain: Ecological connection. Explain:
- Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW

Project wetlands are 10-15 river miles from TNW. Project waters are 5-10 aerial (straight) miles from TNW. Flow is from: No Flow. Estimate approximate location of wetland as within the 5-10-year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland systems are variable.

Identify specific pollutants, if known: Manure, fertilizers, and potential industrial pollutants.

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): Forested 10-100 feet.
- \boxtimes Vegetation type/percent cover. Explain: 50-90% Hydrophytic vegetation classifed as facultative or wetter.
- $\overline{\boxtimes}$ Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings: The higher quality wetlands are capable of providing minimal habitat for ampibians and aquatic insects.

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: 5

Approximately (1.56) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
- Y	0.17	Y	0.90
Y	0.17	Y	0.14
Y	0.18		

Summarize overall biological, chemical and physical functions being performed: The wetlands associated with the 1st order tributaries within the project area are classified as PEM or PSS and total 1.56 acres. Associated wetlands described above meet the 3 defining parameters described in the 1987 US Army Corps of Engineers Wetland Delineation Manual. The wetlands either have a direct hydrologic connection with the associated tributary or are located within a flooplain adjacent providing additional storage of flood water. Additionally wetlands can act as a filter for sediment and runoff before it reaches larger tributaries downstream. Wetlands that are abutting streams have the capability to deliver nutrients to the associated tributary. Biological functions within these wetlands include minimal habitat for aqautic species of insects and amphibians. However, a presence of polluntants and poor water quality can limit an ideal habitat.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: The identified first order tributaries have minimal flow classified as seasonal to intermittent flow (inundated <5 to 20% of the time during the growing(COE 1987)). Due to a lack of flow, first order tributaries within the project area are unlikely to support the transport of nutrients and organic carbon vital to food webs to downstream tributaries. Similarily, the tributaries are unlikely to support the spawning or life stages of aquitic species due to a lack of pool/riffle/run complexes and ideal substrate/canopy cover. The tributaries and associated wetlands are able to provide storage for flood water during high precipitation events particular those wetlands that are located within lower elevation floodplains. Additionally, the tributaries can act a filter for runoff and pollutants from adjacent agricultural land before it is able to flow into the downstream reaches of the nearest TNW (COE 2007).</p>
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. **RPWs that flow directly or** indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
 - Provide estimates for jurisdictional waters in the review area (check all that apply):
 - Tributary waters: linear feet width (ft).
 - Other non-wetland waters: acres.
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

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- Tributary waters: 8175.7 linear feet 2-15width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
 Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: 1.56 acres.

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

6.

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
E.	ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): ¹⁰ which are or could be used by interstate or foreign travelers for recreational or other purposes. from which fish or shellfish are or could be taken and sold in interstate or foreign commerce. which are or could be used for industrial purposes by industries in interstate commerce. Interstate isolated waters. Explain: Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	 Provide estimates for jurisdictional waters in the review area (check all that apply): Tributary waters: linear feet width (ft). Other non-wetland waters: acres. Identify type(s) of waters: . Wetlands: acres.
F.	 NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements. Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce. Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR). Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: Other: (explain, if not covered above):
	 Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply): Non-wetland waters (i.e., rivers, streams): linear feet width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: acres.
	 Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply): Non-wetland waters (i.e., rivers, streams): 8,175 linear feet, 2-15 width (ft). Lakes/ponds: acres. Other non-wetland waters: acres. List type of aquatic resource: Wetlands: 1.56 acres.
SE	CTION IV: DATA SOURCES.
А.	SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below): Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Office concurs with data sheets/delineation report.
 Office does not concur with data sheets/delineation report.
 Data sheets prepared by the Corps:

- Corps navigable waters' study:
 U.S. Geological Survey Hydrologic Atlas:

 - USGS NHD data.
- U.S. Geological Survey map(s). Cite scale & quad name:

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¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

USDA Natural Resources Conservation Service Soil Survey. Citation:
 National wetlands inventory map(s). Cite name:
 State/Local wetland inventory map(s):
 FEMA/FIRM maps:
 100-year Floodplain Elevation is: (National Geodectic Vertical Date)
 Photographs: A Aerial (Name & Date): Duke Energy Carolinas, 2008. or Other (Name & Date):
 Previous determination(s). File no. and date of response letter:
 Annlicable/supporting case law:

(National Geodectic Vertical Datum of 1929)

Previous determination(s). File no. and dat
 Applicable/supporting case law:
 Applicable/supporting scientific literature:
 Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): Α.

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K- Second Order Tributaries**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.914278° N, Long. -81.568320° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 4/8/09 to 4/29/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain[.]

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

- a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
- b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 3816.9 linear feet: 6-20 width (ft) and/or acres. Wetlands: 0.11 acres.
- c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known): varies.
- Non-regulated waters/wetlands (check if applicable):³ 2.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions: Watershed size: Varies Pick List Drainage area: Varies Pick List Average annual rainfall: 49.5 inches Average annual snowfall: NA inches
- (ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>
 ☐ Tributary flows directly into TNW.
 ☑ Tributary flows through 2 tributaries before entering TNW.

Project waters are 1-2 river miles from TNW. Project waters are 1 (or less) river miles from RPW. Project waters are 1-2 aerial (straight) miles from TNW. Project waters are 1 (or less) aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW^5 : Flow route varies. Tributary stream order, if known: Second Order.

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: X Natural Artificial (man-made). Explain: . Manipulated (man-altered). Explain: .
		Tributary properties with respect to top of bank (estimate): Average width: 6-20 feet Average depth: Varies feet Average side slopes: 3:1.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Muck
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Second order tributaries within the project area are typically stable with some erosion. Stability is variable. Presence of run/riffle/pool complexes. Explain: Run/Riffle/Pool complexes were observed however, the presence of these complexes varies. Tributary geometry: Relatively/straight Tributary gradient (approximate average slope): Variable %
	(c)	Flow: Tributary provides for: Intermittent but not seasonal flow Estimate average number of flow events in review area/year: 20(or greater) Describe flow regime: Typical second order streams within the project boundary have seasonal or intermittent flow. Other information on duration and volume:
		Surface flow is: Pick-List . Characteristics: Variable.
		Subsurface flow: <u>Pick List</u> . Explain findings: Subsurface flow was observed at several tributaries within the project area. Where present the subsurface flow typically resurfaced downstream. Dye (or other) test performed:
		Tributary has (check all that apply):
Ň		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Cha Ider	emical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: Water appearnce varies. htify specific pollutants, if known: Potential pollutants include manure and agricultural runoff.
atural or ma	in-ma	de discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where

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⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or whethe OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings: While the presence of habitat varies, observed riffle pools and intermittent to perennial flow can provide habitat for aquatic species, such as amphibians, insects, and macroinvertebrates.

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size:0.11 acres Wetland type. Explain:PFO/PEM. Wetland quality. Explain:Wetland Quality varies. Project wetlands cross or serve as state boundaries. Explain:

(b) <u>General Flow Relationship with Non-TNW</u>: Flow is: <u>No Flow</u>]. Explain:

Surface flow is: Not present Characteristics:

Subsurface flow: No. Explain findings: Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Not directly abutting

- Discrete wetland hydrologic connection. Explain:
- Ecological connection. Explain:
- Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are $5 \cdot 10$ river miles from TNW. Project waters are $5 \cdot 10$ aerial (straight) miles from TNW. Flow is from: No Flow. Estimate approximate location of wetland as within the $2 \cdot 5$ -year floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Wetland systems are variable.

Identify specific pollutants, if known: Manure, fertilizers, and potential industrial pollutants.

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width): Forested 10-100 ft.
- Vegetation type/percent cover. Explain:
- Habitat for:

Federally Listed species. Explain findings:

- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings: Higher quality wetlands can potentially support life stages of aquatic insects and amphibians.

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: $\mathbf{2}$

Approximately (0.11) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)
Y	0.1	Y	0.01

Summarize overall biological, chemical and physical functions being performed: The wetlands associated with the second order non-RPW and RPW features identified in this determination are classified as small PEM or PFO wetlands totalling 0.11 acres. The identified wetlands have the capability to protect downstream flow of the tributaries by acting as a filter for pollutants particularly those associated with active agricultural and pasture lands. Additionally, wetlands in general are able to act as additional flood storage for the associated tributaries during high precipitation events. The higher quality wetlands in the proejct boundary have the potential to provide habitat for aquatic species during life stages.

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D: Second order tributaries with itnermittent to perennial flow and their associated wetlands have the ability to support downstream RPW's and eventually TNW's during high precipitation events by acting as storage for flood waters. The surveyed tributaries had flow 48 hours after recent rain during the survey and are more capable with of containing flood waters. Additionally, tributaries and wetlands can act as filters for pollutants and trap sediment from runoff associated with active cattle pastures, agricultural land, and areas used for commercial and industrial puposes before they are able to reach the higher order streams below. Intermittent to perennial flow within these tribuataries create an ideal habitat for the spawning and support of life stages for aquatic species such as fish, amphibians, macroinvertebrates, and insects. Other biological function may include the use of the water by larger terrestrial animals, such as deer.
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area: 1. TNWs: linear feet width (ft), Or, acres. Wetlands adjacent to TNWs: acres.
- RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
 - Provide estimates for jurisdictional waters in the review area (check all that apply):
 - Tributary waters: linear feet width (ft).
 - Other non-wetland waters: acres
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: **3816.9** linear feet **6-20** width (ft).
 - - Identify type(s) of waters:
- Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. 4.
 - Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - K Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: The wetlands is not separated from the tributary and has a direct hydrologic connection.
 - 🕚 Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.11 acres.

Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs. 5.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

Impoundments of jurisdictional waters.⁹ 7.

- As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- \Box Demonstrate that water is isolated with a nexus to commerce (see E below).

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

E.	ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY): ¹⁰
	which are or could be used by interstate or foreign travelers for recreational or other purposes.
	which are or could be used for industrial purposes by industries in interstate commerce.
	Interstate isolated waters. Explain:
	Other factors. Explain:
	Identify water body and summarize rationale supporting determination:
	Provide estimates for jurisdictional waters in the review area (check all that apply):
	Tributary waters: linear feet width (ft).
	Other non-wetland waters: acres.
	Identify type(s) of waters:
	wetrands: acres.
F.	NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
	If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers
	Wetland Delineation Manual and/or appropriate Regional Supplements.
	Prior to the Jan 2001 Supreme Court decision in "SWANCC." the review area would have been regulated based solely on the
	"Migratory Bird Rule" (MBR).
	Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
	Other: (explain, if not covered above):
	Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
	Lakes/nonds: acres
	Other non-wetland waters: acres. List type of aquatic resource:
	Wetlands: acres.
	Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
	Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
	Categorids. acres. Other non-wetland waters: acres. List type of aquatic resource: .
	Wetlands: acres.
	<i>.</i>
SF(
560	<u>, TIONTY, DATA SOURCES</u> .
A. 5	SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked
	and requested, appropriately reference sources below):
	Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
	Data sneets prepared/submitted by or on benait of the applicant/consultant.
	Office does not concur with data sheets/delineation report.
	Data sheets prepared by the Corps:
	Corps navigable waters' study:
	U.S. Geological Survey Hydrologic Atlas:

- USGS 8 and 12 digit HUC maps.
 U.S. Geological Survey map(s). Cite scale & quad name:
 USDA Natural Resources Conservation Service Soil Survey. Citation:
 National wetlands inventory map(s). Cite name:
 State/Local wetland inventory map(s):

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

)

 FEMA/FIRM maps:
 100-year Floodplain Elevation is: (National Geodectic Vertical Da Photographs: Aerial (Name & Date):Duke Energy Carolinas, 2008. or Other (Name & Date):
 Previous determination(s). File no. and date of response letter: (National Geodectic Vertical Datum of 1929)

.

- Previous determination(s). File no. and dat
 Applicable/supporting case law:
 Applicable/supporting scientific literature:
 Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD:

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Abingdon Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area, [Required]

1. Waters of the U.S.

- a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas П
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
- b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 331.2 linear feet: 30 width (ft) and/or acres. Wetlands: NA acres
- c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- 2. Non-regulated waters/wetlands (check if applicable):³
 - Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally"

⁽e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions: Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches
- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through **PickList** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
	Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
	Primary tributary substrate composition (check all that apply):
	Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
	Surface flow is: Pick List . Characteristics:
	Subsurface flow: <u>Pick List</u> . Explain findings: Dye (or other) test performed:
	Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris changes in the character of soil destruction of terrestrial vegetation shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
	If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
Che Cha	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain

Identify specific pollutants, if known:

(iii)

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

Riparian corridor. Characteristics (type, average width):

Wetland fringe. Characteristics:

Habitat for:

Federally Listed species. Explain findings:

- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:

Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 - Ecological connection. Explain:
 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Ū, Habitat for:

Federally Listed species. Explain findings:

- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:
- Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Abingdon Creek is a large bed and bank perennial stream with well defined stream morphology, including a good riffle-pool sequence, substrate sorting, and an active floodplain.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 331.2 linear feet 30 width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply): acres

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. 4.

- Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
 - Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
 - E Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. 6.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

- Impoundments of jurisdictional waters.⁹ 7.
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or

Demonstrate that water is isolated with a nexus to commerce (see E below).

E.	ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE,
	DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY
	SUCH WATERS (CHECK ALL THAT APPLY): ¹⁰

which are or could be used by interstate or foreign travelers for recreational or other purposes.

- from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- E which are or could be used for industrial purposes by industries in interstate commerce.
- Interstate isolated waters. Explain:
- Other factors. Explain:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

to any water body and summarize rationale supporting determinado	Identify water body and summarize rationale su	pporting determination
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Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters:

Wetlands: acres.

NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): F.

If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.

Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.

Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

acres. List type of aquatic resource:

Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

Lakes/ponds: acres.

Other non-wetland waters: acres. List type of aquatic resource:

Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).

Lakes/ponds: acres.

Other non-wetland waters:

Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:

- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
- Office does not concur with data sheets/delineation report.
- 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: 7. S
- -USDA Natural Resources Conservation Service Soil Survey. Citation:
- 57 National wetlands inventory map(s). Cite name:
- 24 State/Local wetland inventory map(s):
- **FEMA/FIRM maps:**
- . 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- \boxtimes Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008.
 - or Other (Name & Date):
- 10 Previous determination(s). File no. and date of response letter:
- 5 Applicable/supporting case law:
- <u> 1</u> Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Abingdon Creek is a named USGS stream with perennial flow. Some bank failure was observed within the Project boundary. This stream empties into the Broad River approximately 0.7 river mile from the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Fanning Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - 3 Impoundments of jurisdictional waters
 - 2 Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 214.7 linear feet: 20 width (ft) and/or acres. Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):

Non-regulated waters/wetlands (check if applicable):³ 2.

Detentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY);

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:

Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>

Tributary flows directly into TNW.
 Tributary flows through <u>Pick List</u> tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: . Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
	Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
	Primary tributary substrate composition (check all that apply):
	Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
	Surface flow is: Pick List. Characteristics:
	Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
	Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining other (list):
	Discontinuous OHWM.' Explain:
	If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
Che Cha	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Iden	Explain:

Identify specific pollutants, if known:

(iii)

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- **Riparian corridor.** Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) **Physical Characteristics:**

(a) General Wetland Characteristics: Properties:

Wetland size: acres

Wetland type. Explain:

Wetland quality. Explain:

Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain: .

> Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:

 - Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW Project wetlands are **Pick List** river miles from TNW. Project waters are Pick List aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
 - Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or
- biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. <u>RPWs that flow directly or indirectly into TNWs.</u>
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Fanning Creek is a named USGS stream that has year-round flow.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

acres.

- Tributary waters: 214.7 linear feet 20 width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

Tributary waters: linear feet width (ft).

Other non-wetland waters:

Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

- As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰

which are or could be used by interstate or foreign travelers for recreational or other purposes.

from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

which are or could be used for industrial purposes by industries in interstate commerce.

- Interstate isolated waters. Explain:
- Other factors. Explain:

Identify water body and summarize rationale supporting determination:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres

Identify type(s) of waters:

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:

Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- 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:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:

100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

- Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008.
- or Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Thicketty Creek enters the Project boundary approximately 1.4 river miles from its confluence with the Broad River. Although it has a large active floodplain, no jurisdictional wetlands were observed within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD);

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Gault Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \square Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 214.7 linear feet: 10 width (ft) and/or acres. Wetlands: acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions: Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches

(ii) Physical Characteristics:

Average annual snowfall:

(a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

inches

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List. Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): clear, natural line impressed on the bank changes in the character of soil destruction of terrestrial vegetation shelving vegetation matted down, bent, or absent leaf litter disturbed or washed away sediment deposition water staining other (list):
		Discontinuous OHWM.' Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: Mean High Water Mark indicated by: oil or scum line along shore objects survey to available datum; fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Chai Iden	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: tify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- **Riparian corridor.** Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: (i)

(a) General Wetland Characteristics: Properties:

Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain: • •

> Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting □ Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:

 - Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW

Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

Characteristics of all wetlands adjacent to the tributary (if any) 3.

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. **<u>RPWs</u>** that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Gault Creek is a named USGS stream that has year-round flow.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

acres.

- Tributary waters: 214.7 linear feet 10 width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

🔲 Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

- Tributary waters: linear feet width (ft). acres.
- Other non-wetland waters:
 - Identify type(s) of waters:

Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

- 5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 - Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. 6.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

Impoundments of jurisdictional waters.⁹ 7.

- As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from "waters of the U.S.," or
- 10 Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- . Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):10

which are or could be used by interstate or foreign travelers for recreational or other purposes.

from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.

which are or could be used for industrial purposes by industries in interstate commerce.

- Interstate isolated waters. Explain:
- Other factors. Explain:

Identify water body and summarize rationale supporting determination:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

- Identify type(s) of waters:
- Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- ζ*τ*ή. Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- \Box Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Ĩ. Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant. \boxtimes
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - Data sheets prepared by the Corps: y 16
 - 35 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: 蒙
 - USDA Natural Resources Conservation Service Soil Survey. Citation:
 - National wetlands inventory map(s). Cite name:
 - Ē State/Local wetland inventory map(s):
 - FEMA/FIRM maps:
 - 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008.
 - or Other (Name & Date):
 - Previous determination(s). File no. and date of response letter:
 - 2 Applicable/supporting case law:
 - Applicable/supporting scientific literature:
 - Other information (please specify): \square

B. ADDITIONAL COMMENTS TO SUPPORT JD: Thicketty Creek enters the Project boundary approximately 1.4 river miles from its confluence with the Broad River. Although it has a large active floodplain, no jurisdictional wetlands were observed within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Gilkey Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

- Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
- X Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 379.9 linear feet: 40 width (ft) and/or acres. Wetlands: 0.14 acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a **TNW**, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an **RPW is also** jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions: Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through <u>Pick List</u> tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: . Manipulated (man-altered). Explain: .
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain: .
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List . Characteristics:
		Subsurface flow: <u>Pick List</u> . Explain findings: Dye (or other) test performed:
·		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris clear, natural line impressed on the bank destruction of terrestrial vegetation changes in the character of soil destruction of terrestrial vegetation shelving shelving vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Chai Iden	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain: tify specific pollutants, if known:

,

.

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: (i)

- (a) General Wetland Characteristics: Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
- (b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

(c) <u>Wetland Adjacency Determination with Non-TNW:</u> Directly abutting

Not directly abutting

- Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:
- Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:

Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
 - Vegetation type/percent cover. Explain:
- Habitat for:

Federally Listed species. Explain findings:

- Fish/spawn areas. Explain findings:
- Other environmentally-sensitive species. Explain findings:
- Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. <u>RPWs that flow directly or indirectly into TNWs.</u>
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Gilkey Creek is a named USGS stream that has year-round flow.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:
Provide estimates for jurisdictional waters in the review area (check all that apply):

acres.

- Tributary waters: 379.9 linear feet 40 width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Evidence of drainage through a direct hydrologic connection.
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 0.14 acres.

Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
 Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.⁹

- As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
- Demonstrate that impoundment was created from "waters of the U.S.," or
- Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
- Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - Interstate isolated waters. Explain:
 - Other factors. Explain:

Identify water body and summarize rationale supporting determination:

⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters: .

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based <u>solely on the</u> "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
- Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- 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:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:

100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)

- Photographs: Aerial (Name & Date):Duke Energy Carolinas, LLC 2008.
- or 🗋 Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Thicketty Creek enters the Project boundary approximately 1.4 river miles from its confluence with the Broad River. Although it has a large active floodplain, no jurisdictional wetlands were observed within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD);

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Pacolet River**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W. Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.

 \boxtimes Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- \boxtimes Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [Required]

- Waters subject to the ebb and flow of the tide.
- Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

1. Waters of the U.S.

 $\overline{\Box}$

- a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
- b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 204.3 linear feet: NAwidth (ft) and/or acres. Wetlands: NA acres.
- c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):
- Non-regulated waters/wetlands (check if applicable):³ 2.

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions: Watershed size: Pick List Drainage area: [Pick List Average annual rainfall: inches Average annual snowfall: inches

(ii) Physical Characteristics:

(a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through <u>Pick List</u> tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and crossional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List.
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	<u>Flow:</u> Tributary provides for: <u>Pick List</u> Estimate average number of flow events in review area/year: <u>Pick List</u> Describe flow regime: Other information on duration and volume:
		Surface flow is: Pick List . Characteristics:
		Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris changes in the character of soil the presence of litter and debris shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Cha	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

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⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- Habitat for:
 - Federally Listed species. Explain findings:
 - Fish/spawn areas. Explain findings:
 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: (i)

- (a) General Wetland Characteristics: **Properties:** Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
- (b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

Surface flow is: Pick List Characteristics:

Subsurface flow: Pick List. Explain findings: Dye (or other) test performed:

- (c) Wetland Adjacency Determination with Non-TNW:
 - Directly abutting □ Not directly abutting
 - Discrete wetland hydrologic connection. Explain:
 Ecological connection. Explain:
 Separated by berm/barrier. Explain:

(d) <u>Proximity (Relationship) to TNW</u> Project wetlands are **Pick List** river miles from TNW. Project waters are Pick List aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings: Fish/spawn areas. Explain findings:

 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List Approximately () acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. RPWs that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Stream is a USGS named bed and bank perennial channel (Pacolet River). This waterbody has year-round flow.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 204.3 linear feet NA width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:
- Non-RPWs⁸ that flow directly or indirectly into TNWs. 3.
 - Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres.

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

Wetlands directly abutting an RPW that flow directly or indirectly into TNWs. 4

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands. \boxtimes

- K Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: Evidence of drainage through a direct hydrologic connection.
- U Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 1.24 acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs. 6.

E Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce. .
 - Interstate isolated waters. Explain:
 - Other factors. Explain:

⁸See Footnote # 3

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA Memorandum Regarding CWA Act Jurisdiction Following Rapanos.

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):

Tributary waters: linear feet width (ft).

Other non-wetland waters: acres.

Identify type(s) of waters:

Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- **Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.**
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):

Provide acreage estimates for non-jurisdictional waters in the review area, where the <u>sole</u> potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):

Non-wetland waters (i.e., rivers, streams): linear feet width (ft).

Lakes/ponds: acres.

- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):

- Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
- Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
- Data sheets prepared by the Corps:
- Corps navigable waters' study:
- U.S. Geological Survey Hydrologic Atlas:
 - USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name:
- USDA Natural Resources Conservation Service Soil Survey. Citation:
- National wetlands inventory map(s). Cite name:
- State/Local wetland inventory map(s):
- FEMA/FIRM maps:
- 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- Photographs: Aerial (Name & Date):Duke Energy Carolinas, 2008.
 - or 🗌 Other (Name & Date):
- Previous determination(s). File no. and date of response letter:
- Applicable/supporting case law:
- Applicable/supporting scientific literature:
- Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: The Pacolet River is a fourth order stream or larger with a large watershed. It crosses into the Project boundary near the confluence with the Broad River, approximately 3.4 river miles. No jurisdictional wetlands are associated with this stream within the Project boundary.

APPROVED JURISDICTIONAL DETERMINATION FORM **U.S. Army Corps of Engineers**

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD):

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Columbia, SC - William S. Lee III Nuclear Station Transmission Line **Project Route K - Thicketty Creek**

C. PROJECT LOCATION AND BACKGROUND INFORMATION:

State: South Carolina County/parish/borough: Cherokee/Union City: N/A

Center coordinates of site (lat/long in degree decimal format): Lat. 34.927575° N, Long. -81.493177° W

Universal Transverse Mercator:

Name of nearest waterbody: Broad River

Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Broad River Name of watershed or Hydrologic Unit Code (HUC): 03050105

Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request. \boxtimes

 \boxtimes Check if other sites (e.g., offsite mitigation sites, disposal sites, etc...) are associated with this action and are recorded on a different JD form.

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

- Office (Desk) Determination. Date:
- Field Determination. Date(s): 3/30/09 to 4/8/09

SECTION II: SUMMARY OF FINDINGS A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There Pick List "navigable waters of the U.S." within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the

- review area. [Required]
 - Waters subject to the ebb and flow of the tide.
 - Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce. Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There Are "waters of the U.S." within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [Required]

- 1. Waters of the U.S.
 - a. Indicate presence of waters of U.S. in review area (check all that apply): ¹
 - TNWs, including territorial seas
 - Wetlands adjacent to TNWs
 - Relatively permanent waters² (RPWs) that flow directly or indirectly into TNWs
 - Non-RPWs that flow directly or indirectly into TNWs
 - Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
 - Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
 - Impoundments of jurisdictional waters
 - Isolated (interstate or intrastate) waters, including isolated wetlands
 - b. Identify (estimate) size of waters of the U.S. in the review area: Non-wetland waters: 377.3 linear feet: 40 width (ft) and/or acres. Wetlands: 11.95 acres.
 - c. Limits (boundaries) of jurisdiction based on: Established by OHWM. Elevation of established OHWM (if known):

Non-regulated waters/wetlands (check if applicable):³ 2.

Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional. Explain:

² For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).

¹ Boxes checked below shall be supported by completing the appropriate sections in Section III below.

³ Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWS

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a **TNW**, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW

Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW

Summarize rationale supporting conclusion that wetland is "adjacent":

.

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody⁴ is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

- (i) General Area Conditions: Watershed size: Pick List Drainage area: Pick List Average annual rainfall: inches Average annual snowfall: inches
- (ii) Physical Characteristics:
 - (a) <u>Relationship with TNW:</u>

 Tributary flows directly into TNW.
 Tributary flows through <u>Pick List</u> tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW. Project waters are **Pick List** river miles from RPW. Project waters are **Pick List** aerial (straight) miles from TNW. Project waters are **Pick List** aerial (straight) miles from RPW. Project waters cross or serve as state boundaries. Explain:

Identify flow route to TNW⁵: Tributary stream order, if known:

⁴ Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

⁵ Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

	(b)	General Tributary Characteristics (check all that apply): Tributary is: Natural Artificial (man-made). Explain: Manipulated (man-altered). Explain:
		Tributary properties with respect to top of bank (estimate): Average width: feet Average depth: feet Average side slopes: Pick List:
		Primary tributary substrate composition (check all that apply): Silts Sands Concrete Cobbles Gravel Muck Bedrock Vegetation. Type/% cover: Other. Explain:
		Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: Presence of run/riffle/pool complexes. Explain: Tributary geometry: <u>Pick List</u> Tributary gradient (approximate average slope): %
	(c)	Flow: Tributary provides for: Pick List Estimate average number of flow events in review area/year: Pick List Describe flow regime: Other information on duration and volume: Surface flow is: Pick List Characteristics:
		Subsurface flow: PickList. Explain findings:
		Tributary has (check all that apply): Bed and banks OHWM ⁶ (check all indicators that apply): the presence of litter and debris clear, natural line impressed on the bank the presence of litter and debris changes in the character of soil destruction of terrestrial vegetation shelving the presence of wrack line vegetation matted down, bent, or absent sediment sorting leaf litter disturbed or washed away scour sediment deposition multiple observed or predicted flow events water staining abrupt change in plant community other (list): Discontinuous OHWM. ⁷ Explain:
		If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply): High Tide Line indicated by: oil or scum line along shore objects fine shell or debris deposits (foreshore) physical markings/characteristics tidal gauges other (list):
(iii)	Che Chai	mical Characteristics: racterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.). Explain:

Identify specific pollutants, if known:

⁶A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break. ⁷Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- Riparian corridor. Characteristics (type, average width):
- Wetland fringe. Characteristics:
- \square Habitat for:
 - ☐ Federally Listed species. Explain findings: ☐ Fish/spawn areas. Explain findings:

 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

Physical Characteristics: (i)

- (a) General Wetland Characteristics: Properties: Wetland size: acres Wetland type. Explain: Wetland quality. Explain: Project wetlands cross or serve as state boundaries. Explain:
- (b) General Flow Relationship with Non-TNW: Flow is: Pick List. Explain:

Surface flow is: Pick List Characteristics:

Subsurface flow: **Pick List**. Explain findings: Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:

Directly abutting
 Not directly abutting

- Discrete wetland hydrologic connection. Explain:
- Ecological connection. Explain:
- Separated by berm/barrier. Explain:
- (d) Proximity (Relationship) to TNW Project wetlands are **Pick List** river miles from TNW. Project waters are **Pick List** aerial (straight) miles from TNW. Flow is from: Pick List. Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

- Riparian buffer. Characteristics (type, average width):
- Vegetation type/percent cover. Explain:
- Habitat for:
 - Federally Listed species. Explain findings: Fish/spawn areas. Explain findings:

 - Other environmentally-sensitive species. Explain findings:
 - Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately () acres in total are being considered in the cumulative analysis. For each wetland, specify the following:

Directly abuts? (Y/N) Size (in acres)

Directly abuts? (Y/N)

Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

- 1. Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:
- 2. Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:
- 3. Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW. Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

- TNWs and Adjacent Wetlands. Check all that apply and provide size estimates in review area:
 TNWs: linear feet width (ft), Or, acres.
 Wetlands adjacent to TNWs: acres.
- 2. **<u>RPWs</u>** that flow directly or indirectly into TNWs.
 - Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Thicketty Creek is a named USGS stream. This stream has year-round flow, a large active floodplain, and a large watershed. Fish were observed within the channel.
 - Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):

- Tributary waters: 377.3 linear feet 40 width (ft).
- Other non-wetland waters: acres.
 - Identify type(s) of waters:

3. Non-RPWs⁸ that flow directly or indirectly into TNWs.

Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional waters within the review area (check all that apply):

acres

- Tributary waters: linear feet width (ft).
- Other non-wetland waters:
 - Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.

- Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:
- Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: 11.95 acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.

Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

acres.

Provide acreage estimates for jurisdictional wetlands in the review area:

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.

Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

- 7. Impoundments of jurisdictional waters.⁹
 - As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
 - Demonstrate that impoundment was created from "waters of the U.S.," or
 - Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
 - Demonstrate that water is isolated with a nexus to commerce (see E below).
- E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):¹⁰
 - which are or could be used by interstate or foreign travelers for recreational or other purposes.
 - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
 - which are or could be used for industrial purposes by industries in interstate commerce.
 - Interstate isolated waters. Explain:
 - Other factors. Explain:
- ⁸See Footnote # 3.

⁹ To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.

¹⁰ Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos*.

Identify water body and summarize rationale supporting detern

- Provide estimates for jurisdictional waters in the review area (check all that apply):
- Tributary waters: linear feet width (ft).
- Other non-wetland waters: acres.
- Identify type(s) of waters:
- Wetlands: acres.

NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY): F.

- If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
- Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
 - Prior to the Jan 2001 Supreme Court decision in "SWANCC," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
- Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
- Other: (explain, if not covered above):
- Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
- Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
- Lakes/ponds: acres.
- Other non-wetland waters: 5 acres. List type of aquatic resource:
- Wetlands: acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):

- Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
- 1 Lakes/ponds: acres.
- ÷. * Other non-wetland waters: acres. List type of aquatic resource:
- Wetlands: acres.

SECTION IV: DATA SOURCES.

- A. SUPPORTING DATA. Data reviewed for JD (check all that apply checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
 - Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant:
 - Data sheets prepared/submitted by or on behalf of the applicant/consultant.
 - Office concurs with data sheets/delineation report.
 - Office does not concur with data sheets/delineation report.
 - 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:
 - \Box USDA Natural Resources Conservation Service Soil Survey. Citation:
 - National wetlands inventory map(s). Cite name:
 - State/Local wetland inventory map(s):
 - **FEMA/FIRM** maps:
 - 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
 - Photographs: Aerial (Name & Date):Duke Energy Carolinas, 2008. or Other (Name & Date):
 - Previous determination(s). File no. and date of response letter:
 - Applicable/supporting case law:
 - Applicable/supporting scientific literature:
 - Other information (please specify):

B. ADDITIONAL COMMENTS TO SUPPORT JD: Thicketty Creek enters the Project boundary approximately 1.4 river n	niles from its
confluence with the Broad River. Although it has a large active floodplain, no jurisdictional wetlands were observed within the	Project
boundary.	-

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AH County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1

SCORE: _____

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCODE. C		, , , , , , , , , , , , , , , , , , , ,	e tro tro

SCORE: <u>6</u>

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <			
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.			
feet on each side.	feet on each side.	on each side.				
10	8	5	1			

SCORE: 7

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks: numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1
SCOPE. 8	kommune i serie		······

SCORE: 8

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: <u>5</u>

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
000 0 00 0			

SCORE: 6

USDA - NRCS Wildlife Habitat Incentives Program

10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

Coluwater Fishery (I it	Coluwater Fishery (Fickens, Oconee, Greenvine Counties above US fiwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			
Warm water fishery (a	ll area of S.C. except as noted	above)				

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	· 1

SCORE: <u>5</u>

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): _____

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AI

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
6600 0	,	· · · · · · · · · · · · · · · · · · ·	

SCORE: 5

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.	· · · ·	a 1 year rain event or less.
not incised.			
10	7	3	1

SCORE: 2

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000 10			

SCORE: 10

USDA - NRCS

Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots extending into the base	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea	Occasionally cloudy,	Considerable	Very turbid or muddy
colored; objects visible at	especially after storm	cloudiness most of the	appearance most of the
depths of 3-6 feet. No	event; but clears	time; objects visible to	time; objects visible to
noticeable film on surface	rapidly; objects	depth of .5-1.5 feet;	depth <.5 feet; heavy coat
or submerged objects.	visible at depth of	submerged objects with	of film on surface or
	1.5-3 feet; may have	heavy green film, or	submerged objects; strong
	slight green color.	moderate odor of	odor of ammonia.
		ammonia.	
10	7	3	1

SCORE: <u>7</u>

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
7	3	1
	Pools present, but not abundant (<3); pools at least 3 ft. deep. 7	Pools present, but not abundant (<3); pools at least 3 ft. deep.Pools present, but shallow, <3 ft. deep.73

SCORE: <u>5</u>

USDA - NRCS

South Carolina October, 2005

Wildlife Habitat Incentives Program

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warma mater Calaria (a	Il anno aff C anno a anno an	1.1.		

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	

SCORE: ____7

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AJ County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	L
10	7	. 3	1
CODD 7			

SCORE: _____

2. Hydrology Alteration (flooding is out of bank flooding)

not incised.	7	3	1
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000 10			

SCORE: <u>10</u>

USDA - NRCS Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 9

5. Water Appearance

of water repearance			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
CODE -				

SCORE: <u>6</u>

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 7

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPF. 8			

SCORE: <u>*</u>

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 7

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AK

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- •••• Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	_
10	7	3	1
CODE 9			

SCORE: 8

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 7		1	

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: 10

USDA - NRCS Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3 ·	1

SCORE: 10

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within
				reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE: 7			

2

USDA - NRCS Wildlife Habitat Incentives Program

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warm water fishery (all area of S.C. except as noted above)				

 25-90% of reach shaded.
 >90% shaded; full canopy.
 <25% of surface shaded in reach.</th>

 10
 7
 1

SCORE: 8

11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodnlain	Extensive amount of manure on banks or in stream.
noouplain		поочрішні	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ____8.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC _____Date: ____4/06/2009 ____Stream AL

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
00000 7			

SCORE: ___7

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: ⁶			-

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
aconn 9			

SCORE: 8

USDA - NRCS

Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

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SCORE: 7

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	. 7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
000DE 8				

SCORE: ____8___

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 5

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
00000 F			

SCORE: <u>5</u>

USDA - NRCS

Wildlife Habitat Incentives Program

10. Canopy Cover (Use coldwater or warm water below, not both)

<u>Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)</u>				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-00% of reach shaded	>00% shaded full canony	<25% of surface shaded in reach
25-9070 Of Teach Shaucu.	> 9078 shaucu, full callopy.	~2576 OF Sufface Shaucu in reach.
10	7	1

SCORE: ____7

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: ____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AM

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

cutting or excessive lateral cutting	are set back to provide access to an adequate floodplain.	braided channel. Dikes or levees restrict floodplain.	Dikes or levees prevent access to the floodplain.
10	7	3	1
SCODE A	······	5	¥

SCORE: ____

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
not incised.	nabitat for blota.		a 1 year rain event or less.
10	7	3	1
SCORE: 3	· · · · ·		

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: <u>10</u>

USDA - NRCS Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: <u>5</u>

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5 -	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1 .
SCODE: 4	• • • • • • • • • • • • • • • • • • • •		

SCORE: _____

10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)						
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			
Warm water fishery (a	ll area of S.C. except as noted	above)				
25-90% of reach shaded	>90% shaded; full can	opy. <25% of sur	face shaded in reach.			
10	10 7		1			

SCORE: 6

11. Manure Presence

No livestock accessible to stream,	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage	Extensive amount of manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 5.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner	's Name: _	Duke	Energy	Carolinas,	LLC	Date: 2	4/06/200	9	Stream	AN
County:	Cherokee	Coun	ty Pr	enared by:	Kriste	n Roop	/ Jason	Isbanio	ly	

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1
SCORE: 6	· · · · · · · · · · · · · · · · · · ·		•·····································

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 2			

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

extends more than 50 feet on each side.extends at least 35 feet on each side.extends at least 15 feet on each side.15 feet on each side.feet on each side.in each side.in each side.in each side.	Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
feet on each side. feet on each side. on each side.	extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
	feet on each side.	feet on each side.	on each side.	
	10	8	5	1

SCORE: 8

1

USDA - NRCS Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _6___

5. Water Appearance

Very clear; or clear but tea	Occasionally cloudy,	Considerable	Very turbid or muddy
colored; objects visible at	especially after storm	cloudiness most of the	appearance most of the
depths of 3-6 feet. No	event; but clears	time; objects visible to	time; objects visible to
noticeable film on surface	rapidly; objects	depth of .5-1.5 feet;	depth <.5 feet; heavy coat
or submerged objects.	visible at depth of	submerged objects with	of film on surface or
	1.5-3 feet; may have	heavy green film, or	submerged objects; strong
	slight green color.	moderate odor of	odor of ammonia.
		ammonia.	
10	7	3	1

SCORE: <u>5</u>

1

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft.Pools present, but not abundant (<3); pools at least 3 ft. deep.		Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
deep.			
10	7	3	1
CODE (•

SCORE: 6

2
10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)						
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 5

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ______

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC _____Date: 4/06/2009 Stream AO

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP, Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	· · · · · · · · · · · · · · · · · · ·
10	7	3	1
			· · · · · · · · · · · · · · · · · · ·

SCORE: <u>7</u>

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1 -
SCORE: 6			

SCORE: _6___

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	. 1
SCORE: 10			

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1 .

SCORE: 7

5. Water Appearance

Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
7	3	1
	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.73

SCORE: 8

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

withdrawals inhibit movement of fish.	culverts (<1 foot drop) present within reach.	culverts, or dams present within 3 miles of reach.	culverts, or dams (>1 foot drop) present within reach.
8	5	3	1
	withdrawals inhibit movement of fish.	withdrawals inhibit movement of fish.culverts (<1 foot drop) present within reach.85	withdrawals inhibit movement of fish.culverts (<1 foot drop) present within reach.culverts, or dams present within 3 miles of reach.853

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft.Pools present, but not abundant (<3); pools 3 ft. deep.		Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE: 5			

South Carolina October, 2005

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pic	Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			
Warm water fishery (all area of S.C. except as noted above)						

25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</th>1071

SCORE: 6

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

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STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AP

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
CODD F			

SCORE: _5____

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 6			

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation

hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
200 B B			

SCORE: ____

Banks are stable; banks are	Moderately stable:	Moderately unstable:	Unstable: banks are high
low and at elevation of	banks are low: <33%	banks are high and	and eroding in some
active floodplain: 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks: numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	`
flow elevation.		slope failures.	
10	7	3	1
SCODE: 5		· · · · ·	· · · · · · · · · · · · · · · · · · ·

SCORE: 5

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
		ammonia.	
10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	. 1

SCORE: 4

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
SCOPE.				

SCORE: ____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
	•			types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE, 2			

SCORE: ____

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USDA - NRCS

Wildlife Habitat Incentives Program

10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	. 3	1		
Warm water fishery (all area of S.C. except as noted above)					

25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</th>1071

SCORE: <u>6</u>

11. Manuré Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian a rea .	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): _5.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5-8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AQ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
00000			

SCORE: <u>6</u>

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCOPE: 6			

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
SCODE: 10			

SCORE: <u>10</u>

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _6___

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: ____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.	ł
10	7	3	1	-

SCORE: _4____

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)						
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			
Warm water fishery (a	ll area of S.C. avcent as noted	abova	-			

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>1071

SCORE: 7

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ____6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair 🕤
7.5 – 8.9	Good
> 9.0	Excellent

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STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/06/2009 Stream AR County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1
COODE 5			

SCORE: 5

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: ²			-

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: <u>9</u>

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	• 7	. 3	1

SCORE: 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft.Pools present, but not abundant (<3); pools at least 3 ft. deep.		Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE:		· · · · · · · · · · · · · · · · · · ·	

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South Carolina October, 2005

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
We are set of the set of					

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>1071

SCORE: 6

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): _______

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______ Duke Energy Carolinas, LLC _____ Date: 4/06/2009 Stream AS

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1 /
-			

SCORE: 6

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding: channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
vears. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals.	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.		-	
10	7	3	1
SCODE 7			A

SCORE: ____

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
660 0 7 10			

SCORE: <u>10</u>

4. Bank Stability

· · · · · · · · · · · · · · · · · · ·			
Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7 ·	3	1

SCORE: 8

5. Water Appearance

er muser appearance			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 9

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 5

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	. 1

SCORE: _____

9. Pools

pools abundant (>3); pools at least 5 ft. deep.	abundant (<3); pools at least 3 ft. deep.	shallow, <3 ft. deep.	bottom visible.
10	7	3	1

SCORE: 2

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10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (a	ll area of S.C. areant as noted	abovo)			

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>1071

SCORE: 6

11. Manure Presence

No livestock accessible to stream, riparian area, or	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in	Extensive amount of manure on banks or in stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______ Duke Energy Carolinas, LLC ____ Date: _____ 4/07/2009 Stream AT

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures.	alteration, but with significant	of the reach with riprap	cutting or widening.
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation:	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting	· · · · · · · · · · · · · · · · · · ·	floodplain.	F
10	7	3	1
~~~~~ 7			

SCORE: <u>7</u>____

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCODE 9			

SCORE: 8

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** <u>10</u>

USDA - NRCS

Wildlife Habitat Incentives Program

## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** <u>5</u>

## 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
		ammonia.	
10	r <b>7</b>	3	1

**SCORE:** 7

#### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear.or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	`8	5	3	1

SCORE: _____

## 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	. 3	1

SCORE: _____

9. Pools

5 ft. 3 ft. deep.
7 3 1
7 3

L: ___

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		

Warm water fishery (all area of S.C. except as noted above)

****		
25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 8

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or	i	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: ____

AVERAGE SCORE (TOTAL SCORE / 11): ____7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

# Habitat Quality Rating

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

3

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream AU County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

dikes. No evidence of down cutting or excessive lateral	recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict floodplain	<ul> <li>&gt;50% of the reach with riprap or channelization.</li> <li>Dikes or levees prevent access to the floodplain.</li> </ul>
10	7	3	1
10 5CODE 7	7	3	1

SCORE: _

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
CODE (			

### SCORE: ____6

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** <u>10</u>

## 4. Bank Stability

Banks are stable: banks are	Moderately stable:	Moderately unstable:	Unstable: banks are high
low and at elevation of	banks are low: <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks: numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _5____

## 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** 7

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 7

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: __4___

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface shaded and upstream	>50% shaded in reach; or >75% shaded in reach and	20-50% shaded.	<20% shaded in reach.		
2-3 miles generally	2-3 miles upstream poorly shaded				
Silducu.	Shadea.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					
05.000/ 0 1 1 1 1	0.00/ 1 1 1 0 11				

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

## SCORE: 6

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner	's Name: _	Duke	Energy	Carolinas,	LLC	Date: _	4/07/20	009	Stream	AV
County:	Cherokee	Count	y Pr	epared by:	Kriste	n Roop/	Jason	Isbanio	ly	

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel:	Evidence of past channel	Altered channel: <50%	Channel is actively down
ratural ollalilloi,	Evidence of past channel	Anereu challiel, ~3076	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
CODE 4			

SCORE: 4

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: ³			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1
200 <b>00</b> 10			

**SCORE:** <u>10</u>

1

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## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.	· · · · · · · · · · · · · · · · · · ·	slope failures.	
10	7	3	1

**SCORE:** <u>5</u>

## 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** 7

#### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	. 7	3	1
SCODE: 2	-		•

**SCORE:** <u>3</u>

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#### 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hw

	Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
	>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
	shaded and upstream	>75% shaded in reach and			
	2-3 miles generally	2-3 miles upstream poorly			
	shaded.	shaded.			
1	10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.		
10	7	1		

SCORE: ______

## 11. Manure Presence

No livestock accessible to stream, riparian area, or	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in	Extensive amount of manure on banks or in stream.
floodplain.		floodplain.	
10	5	3	, 1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): <u>5.9</u>

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______ Duke Energy Carolinas, LLC _____ Date: _____ 4/07/2009 _____ Stream AW

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel:	Evidence of past channel	Altered channel: <50%	Channel is actively down
no structures	alteration but with significant	of the reach with ripran	cutting or widening
dikes No	recovery of channel and	and/or channelization	>50% of the reach with
uikes. Ind	recovery of charmer and	anu/or chaimenzation.	~30% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
CODE 4			

SCORE: 4

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present. do	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow
stream's access to the floodplain. Channel is not incised.	not affect available habitat for biota.	habitat for biota.	habitat. Or flooding occurs on a 1 year rain event or less.
10	7	3	1
SCORE: ⁵			······································

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
10			

SCORE: 10

1

Moderately stable:	Moderately unstable:	Unstable: banks are high
banks are low: <33%	banks are high and	and eroding in some
of eroding banks are	flooding occurs 1 year	straight reaches and inside
on outside bends and	out of 5 or less	banks: numerous slope
are protected by roots	frequently. Outside	failures.
extending into the	banks are actively	
base flow.	eroding with some	
	slope failures.	
7	3	1
	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.73

SCORE: 5

## 5. Water Appearance

et water repetitunet		,	
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 4

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: _4____

# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warm water fishery (all area of S.C. except as noted above)				
ac 000/ 0 1 1 1 1	0.00/ 1 1 1 0.11	0.50/ 0.0		

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1.

SCORE: 6

## 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____5.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream AX County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

cutting or excessive lateral	are set back to provide access to an adequate floodplain.	braided channel. Dikes or levees restrict	Dikes or levees prevent access to the floodplain.
cutting 10	7	floodplain. 3	· 1
000DB 0			

**SCORE:** <u>3</u>

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 5		• • • • • • • • • • • • • • • • • • • •	

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000			

**SCORE:** <u>4</u>

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 3

## 5. Water Appearance

Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
7	3	1
	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color. 7	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.73

SCORE: 6

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	. 7	3	1

SCORE: 4

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
SCODE.				

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 2			

SCORE: 3

# 10. Canopy Cover (Use coldwater or warm water below, not both)

<u>Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)</u>					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	. 3	1		
XX7 / C 1 /					

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>1071

SCORE: 4

#### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: ____

AVERAGE SCORE (TOTAL SCORE / 11): ____4.0

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream AY

County: Cherokee County Prepared by: Kristen Roop/ Jason

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral cutting	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
cutting	•	floodplain.	
10	7	3	1
SCORE: 3			

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.	,		
10	7	3	1
SCOPF: 4			

#### SCORE: ____

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	· 1

**SCORE:** 10

USDA - NRCS

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Wildlife Habitat Incentives Program

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	· ·
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** 6

## 5. Water Appearance

et that a production of the second			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: _5____

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 6

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: ____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE: 3			····

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## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.		<20% shaded in reach.
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	1
Warm water fishery (all area of S.C. except as noted above)				

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks ór in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): <u>5.4</u>

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______ Duke Energy Carolinas, LLC Date: ______ Date: ______ J/07/2009 Stream AZ

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
00000			

SCORE: 6

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no	Flooding occurs only once every 3-5 years; limited channel	Flooding occurs only once every 6-10 years; channel deeply incised.	No flooding; channel deeply incised or structures prevent access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 7			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
CODE. C			

**SCORE:** <u>5</u>

USDA - NRCS

Wildlife Habitat Incentives Program

## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

#### 5. Water Appearance

Very clear; or clear but tea	Occasionally cloudy,	Considerable	Very turbid or muddy	
colored; objects visible at	especially after storm	cloudiness most of the	appearance most of the	
depths of 3-6 feet. No	event; but clears	time; objects visible to	time; objects visible to	
noticeable film on surface	rapidly; objects	depth of .5-1.5 feet;	depth <.5 feet; heavy coat	
or submerged objects.	visible at depth of	submerged objects with	of film on surface or	
	1.5-3 feet; may have	heavy green film, or	submerged objects; strong	
	slight green color.	moderate odor of	odor of ammonia.	
		ammonia.		
10	7	3	1	

SCORE: 8

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** <u>7</u>

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE. 5			

**SCORE:** <u>5</u>,

.
South Carolina October, 2005

### Wildlife Habitat Incentives Program

### 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	.7	1

SCORE: 6

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 3/30/2009 Stream B

County: Union County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	_
10	7	3	1

SCORE: 1

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
CODE 1			

SCORE: 1

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
aaaaa 10			

**SCORE:** <u>10</u>

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.	the second s	slope failures.	
10	7	. 3	· 1

**SCORE:** 1

### 5. Water Appearance

water representance			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: 3

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 1

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 1

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: 1

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE: 3			• • • • • • • • • • • • • • • • • • •

# Wildlife Habitat Incentives Program

# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream >75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
		1		

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 10

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: N/A

AVERAGE SCORE (TOTAL SCORE / 11): <u>3.2</u>

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC _____Date: ______A/07/2009 _____Stream BA

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCODE. 7			

SCORE: ____

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on
floodplain. Channel is not incised.	habitat for biota.	haonat ior olora.	a 1 year rain event or less.
10	7	3	1
SCORE: ⁶			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000 10			

**SCORE:** <u>10</u>

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	·
10	7	3	1

**SCORE:** <u>5</u>

### 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
		ammonia.	
10	7	3	1
-			

SCORE: 9

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

**SCORE:** _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

**SCORE:** 5

9. Pools

>* x 0015			
Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
<b>SCORE:</b> 6			s

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## 10. Canopy Cover (Use coldwater or warm water below, not both)

<u>Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)</u>				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.	l		
10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: ____7

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ____6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC ____Date: ____4/07/2009 ____Stream BB

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	_
10	7	3	1

SCORE: 6

#### 2. Hydrology Alteration (flooding is out of bank flooding)

		U	
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.		,	_
10	7	3	1
SCORE: 4			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1
~ ~			

**SCORE:** 8

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

## 5. Water Appearance

et trater repetition			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1
10	1.5-3 feet; may have slight green color.	heavy green film, or moderate odor of ammonia. 3	submerged object odor of ammonia.

**SCORE:** 7

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

3	1
	3

**SCORE:** <u>7</u>

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warm water fishery (a	ll area of S.C. except as noted	above)		

 warm water insnery (all area of S.C. except as noted above)

 25-90% of reach shaded.
 >90% shaded; full canopy.
 <25% of surface shaded in reach.</td>

 10
 7
 1

SCORE: 8

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ____6.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

# **Habitat Quality Rating**

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream BC

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	. 7	3	1
CODE 1			

SCORE: 4

### 2. Hydrology Alteration (flooding is out of bank flooding)

	<u> </u>		
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	. 7	3	1
CODE E			

#### SCORE: <u>5</u>

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: <u>8</u>

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1
SCORE: _4			

# 5. Water Appearance

Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
7	3	1
	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color. 7	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.73

# **SCORE:** 7

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

### 7. Barriers to Fish Movement

novement of fish.	within reach.	miles of reach.	(>1 foot drop) present within reach.
8	5	3	1
	8	arop) present     within reach.	a drop) present within reach.present within 3 miles of reach.853

SCORE: _____

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
00000 3			

**SCORE:** <u>3</u>

# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pic	kens, Oconee, Greenville Cou	inties above US Hwy II)	
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
shaded and upstream	>75% shaded in reach and		
2-3 miles generally	2-3 miles upstream poorly		
shaded.	shaded.		
10	7	3	1
Warm water fishery (a	ll area of S.C. except as noted	above)	
25-90% of reach shaded	>90% shaded; full canc	opy. <a>&lt;25% of surface shaded in reach.</a>	
10	7		1

SCORE: 6

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or	· ·	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): _5.6_

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream BD

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	· · ·
10	7	3	1

**SCORE:** 7

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	. 1
COODE (			•

SCORE: 6

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: 8

Wildlife Habitat Incentives Program

## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _6

### 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** 7

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 9

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
SCOPE. 7				· · · · · · · · · · · · · · · · · · ·

SCORE: _7____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types 2-3 cover types		1 or less cover
				types present.
10	8	5	3	1

SCORE: 6

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3 .	1
SCODE: 7	****		

**SCORE:** _7___

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)							
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.				
shaded and upstream	>75% shaded in reach and						
2-3 miles generally	2-3 miles upstream poorly						
shaded.	shaded.						
10	7	3	1				
Warm water fishery (a	Warm water fishery (all area of S.C. except as noted above)						

watch match history (an area	of S.C. except as noted above)	
25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

**SCORE:** 7

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ______

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowne	r's Name: _	Duke Ene	ergy Carolinas	3, LLC	Date:	4/07/2	009	Stream	BE
County:	Cherokee	County	Prepared by:	Kriste	n Roop/	Jason	Isbanic	oly	

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1
SCOPE: 6			

SCORE: <u>°</u>

#### 2. Hydrology Alteration (flooding is out of bank flooding)

the second se			
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCODE: 7			-

#### **SCORE:** _____

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** 7

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _6

### 5. Water Appearance

Very clear; or clear but tea colored: objects visible at	Occasionally cloudy, especially after storm	Considerable cloudiness most of the	Very turbid or muddy appearance most of the
depths of 3-6 feet. No noticeable film on surface or submerged objects.	event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: ____6

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
. 10	7	3	1
SCORE:6			• · · · · · · · · · · · · · · · · · · ·

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	haded and upstream >75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
W C.I. (				

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>

7

### SCORE: 8

### 11. Manure Presence

10

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: ____

AVERAGE SCORE (TOTAL SCORE / 11): 6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream BF County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCODE 6			

SCORE: ____

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
. 10	7	3	1
SCORE: 4			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** <u>10</u>

### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

## 5. Water Appearance

Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
	ammoma.	
7	3	1
	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.73

**SCORE:** <u>7</u>

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE:

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE:

9. Pools

pools abundant (>3); pools at least 5 ft. deep.	abundant (<3); pools at least 3 ft. deep.	shallow, <3 ft. deep.	bottom visible.
10	7	3	1

**SCORE:** <u>3</u>

### 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

Coldwater Fisnery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warm water fichery (a	I area of S.C. areant or noted	aharra)		

 Warm water fishery (all area of S.C. except as noted above)

 25-90% of reach shaded.
 >90% shaded; full canopy.
 <25% of surface shaded in reach.</td>

 10
 7
 1

SCORE: 9

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.8

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: _____Duke Energy Carolinas, LLC ___Date: ____4/07/2009 _____Stream BG

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

			/
Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1

SCORE: <u>8</u>

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on
stream's access to the floodplain. Channel is	not affect available habitat for biota.	habitat for biota.	habitat. Or flooding occurs on a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 5			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000 10			

**SCORE:** <u>10</u>

Wildlife Habitat Incentives Program

### 4. Bank Stability

Banks are stable; banks are low and at elevation of active floodplain; 33% or more of eroding banks are on outside bends and are protected by roots	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the	Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively	Unstable; banks are high and eroding in some straight reaches and inside banks; numerous slope failures.
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10 .	7	3	1

**SCORE:** 7

## 5. Water Appearance

Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
7	3	1
	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color. 7	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.73

SCORE: 8

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 8

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCODE. C			

SCORE: ____6

### 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.	•		
10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.		
10	7	1		

SCORE: _6____

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or	-	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

# **Habitat Quality Rating**

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

Wildlife Habitat Incentives Program

### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream BH

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCODE 0			

SCORE: <u>8</u>

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			•
10	7	3	1
SCORE: 7			••••••••••••••••••••••••••••••••••••••

### _____

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** <u>10</u>

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** 7

### 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** 7

#### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: 8

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _6

9. Pools

·· • • • • • • • • • • • • • • • • • •			
Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
<b>SCORE:</b> 7	• · · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	• · ·

South Carolina October, 2005

## 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
2-3 miles generally	2-3 miles unstream poorly		
shaded.	shaded.		
10	7	3	1
Werm water fishery (all area of S.C. areant as noted above)			

 Warm water fishery (all area of S.C. except as noted above)

 25-90% of reach shaded.
 >90% shaded; full canopy.
 <25% of surface shaded in reach.</td>

 10
 7
 1

**SCORE:** 7

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

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### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/07/2009 Stream BI County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1

SCORE: 6

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0	Flooding occurs only once every 3-5 years;	Flooding occurs only once every 6-10 years;	No flooding; channel deeply incised or structures prevent
years. No dams, no water withdrawals, no	incision. Or	Channel deeply incised. Or withdrawals	access to floodplain or dam operations prevent flood
dikes or other structures limiting the	withdrawals, although present, do	significantly affect available low flow	flows. Or withdrawals have caused severe loss of low flow
stream's access to the floodplain. Channel is	not affect available habitat for biota.	habitat for biota.	habitat. Or flooding occurs on a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: ³			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: _____

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** _7____

7

### 5. Water Appearance

of thater representance			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** <u>6</u>

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
SCORE:				·

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.Pools present, but not abundant (<3); pools at least 3 ft. deep.		Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 3			

SCORE: 3

### 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
shaded and upstream	>75% shaded in reach and		
2-3 miles generally	2-3 miles upstream poorly		
shaded.	shaded.		
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</td>1071

**SCORE:** 7

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.	· .	floodplain.	
10	5	3	1

SCORE: ____

AVERAGE SCORE (TOTAL SCORE / 11): ____5.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner	's Name: _	Duke	Energy	Carolinas,	LLC	Date:	4/07/2	009	Stream	вJ
County:	Cherokee	Count	y Pr	epared by:	Kriste	n Roop/	Jason	Isbanio	ly	

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	•
10	7	3	1
		······································	

**SCORE:** <u>5</u>

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	-1
SCORE: 7			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
00000			

**SCORE:** <u>7</u>

# Wildlife Habitat Incentives Program

## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.	·	slope failures.	
10	7	3	1

SCORE: 8

### 5. Water Appearance

5. Water Appearance			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface	Occasionally cloudy, especially after storm event; but clears rapidly; objects	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet;	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat
or submerged objects.	visible at depth of 1.5-3 feet; may have slight green color.	submerged objects with heavy green film, or moderate odor of ammonia.	of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** <u>5</u>

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 3			-

**SCORE:** <u>3</u>

1

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# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)				
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

## SCORE: 6

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

### SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____5.9

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

Wildlife Habitat Incentives Program

### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______Duke Energy Carolinas, LLC _____Date: _____4/08/2009 _____Stream BK

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures, dikes. No evidence of down cutting or excessive lateral	Evidence of past channel alteration, but with significant recovery of channel and banks. Any dikes or levees are set back to provide access to an adequate floodplain.	Altered channel; <50% of the reach with riprap and/or channelization. Excess aggradation; braided channel. Dikes or levees restrict	Channel is actively down cutting or widening, >50% of the reach with riprap or channelization. Dikes or levees prevent access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCODE: 9			

SCORE: 9

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is not incided	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
	7	2	<u> </u>
<b>SCORE:</b> 7	/	3	<u> </u>

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** 10

Wildlife Habitat Incentives Program

Banks are stable; banks are	Moderately stable;	Moderately unstable:	Unstable: banks are high
low and at elevation of	banks are low: <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks: numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

## 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1
0			

# SCORE: 8

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 9

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	· 3	1

**SCORE:** 7

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

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>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: ____8____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3 -	1
CODD (			

SCORE: ____6
1

# 10. Canopy Cover (Use coldwater or warm water below, not both)

<u>Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)</u>					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					
25-90% of reach shaded	>90% shaded; full cand	canopy. <25% of surface shaded in reach.			

10 7

SCORE: 7

#### 11. Manure Presence

No livestock accessible to stream, riparian area, or floodplain.	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage structure located in floodplain.	Extensive amount of manure on banks or in stream.
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.7

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: ______ Duke Energy Carolinas, LLC _____ Date: _____4/08/2009 _____ Stream BL

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	•
10	7	3	1
SCODE: 9			•

SCORE: ____

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 7		······	

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	,
10	8	5	1

SCORE: _____10___

1

### 4. Bank Stability

(

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** 10

### 5. Water Appearance

FF			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1
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SCORE: 8

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** _7

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
CCODE 0				

**SCORE:** <u>8</u>

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: 5

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCODE: 4			

SCORE: _____

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2

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# 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					
25-90% of reach shaded	. >90% shaded; full cand	opy. <25% of sur	face shaded in reach.		
10	7		1		

SCORE: 7

### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or	,	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 7.5

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/08/2009 Stream BM

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
CODE 7			

SCORE: ____

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the floodplain. Channel is	Flooding occurs only once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available habitat for biota.	Flooding occurs only once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	No flooding; channel deeply incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on a 1 year rain event or less.
not incised.	habitat for biota.		a I year rain event or less.
10	7	3	1
SCORE: 5			•

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** <u>10</u>

#### 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

**SCORE:** 7

## 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
		ammonia.	
10	7	3	1

**SCORE:** 7

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 10

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCORE: _4	· · · · · · · · · · · · · · · · · · ·		

# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					

25-90% of reach shaded. <25% of surface shaded in reach. >90% shaded; full canopy. 10 7 1

SCORE: 7

#### **11. Manure Presence**

11. Manure Presence			
No livestock	Evidence of livestock access to riparian area	Occasional manure in stream: waste storage	Extensive amount of manure on banks or in
riparian area, or	to inparian area.	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): _____

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/08/2009 Stream BN

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1
CODD 5			

SCORE: ____

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			-
10	7	3	1
CODE 7			

SCORE: 7

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

**SCORE:** 10

Moderately stable;	Moderately unstable;	Unstable; banks are high
banks are low; <33%	banks are high and	and eroding in some
of eroding banks are	flooding occurs 1 year	straight reaches and inside
on outside bends and	out of 5 or less	banks; numerous slope
are protected by roots	frequently. Outside	failures.
extending into the	banks are actively	
base flow.	eroding with some	
	slope failures.	
7	3	1
	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.73

**SCORE:** <u>5</u>

## 5. Water Appearance

Very clear; or clear but tea	Occasionally cloudy,	Considerable	Very turbid or muddy
colored; objects visible at	especially after storm	cloudiness most of the	appearance most of the
depths of 3-6 feet. No	event; but clears	time; objects visible to	time; objects visible to
noticeable film on surface	rapidly; objects	depth of .5-1.5 feet;	depth <.5 feet; heavy coat
or submerged objects.	visible at depth of	submerged objects with	of film on surface or
	1.5-3 feet; may have	heavy green film, or	submerged objects; strong
	slight green color.	moderate odor of	odor of ammonia.
		ammonia.	
10	7	3	1

**SCORE:** <u>6</u>

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

**SCORE:** 7

## 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE:

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
<b>SCORE:</b> 4			•

2

# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

	, , , , , , , , , , , , , , , , , , , ,			
>75% of water surface >50% shaded in reach; or		20-50% shaded.	<20% shaded in reach.	
shaded and upstream	>75% shaded in reach and			
2-3 miles generally	2-3 miles upstream poorly			
shaded.	shaded.			
10	7	3	1	
Warm water fishery (all area of S.C. except as noted above)				

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 6

## 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): 6.3

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

#### STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner	's Name:	Duke	Energy	Carolinas,	LLC	Date:	4/08/20	009	Stream	во
County:	Cherokee	Count	^{.y} Pro	epared by:	Krister	n Roop/	Jason	Isbanio	ly	

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel; no structures,	Evidence of past channel alteration, but with significant	Altered channel; <50% of the reach with riprap	Channel is actively down cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCOPF: 6			

#### SCORE: 6

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCODE: 8			

#### SCORE: 8

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1 .

**SCORE:** <u>7</u>

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1
10	1	3	1

SCORE: _6

# 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: ____7

## 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7 .	3	1
SCORE: 6	· · · · · · · · · · · · · · · · · · ·		

SCORE: 6

# 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

SCORE: 4

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft.Pools present, but not abundant (<3); pools at least 3 ft. deep.		Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: ___

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# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles generally 2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (a	ll area of S.C. avaant as noted	(abova)			

Warm water fishery (all area of S.C. except as noted above)25-90% of reach shaded.25-90% of reach shaded.1071

**SCORE:** 9

#### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/08/2009 Stream BP

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

	ion (anodance mocale inter se Bene					
Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down			
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,			
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with			
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.			
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent			
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.			
cutting		floodplain.				
10	7	3	1			
SCODE: 9						

SCORE: _9___

### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
SCORE: 9			

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
000DD 10			

**SCORE:** <u>10</u>

# 4. Bank Stability

Moderately stable;	Moderately unstable;	Unstable; banks are high
banks are low; <33%	banks are high and	and eroding in some
of eroding banks are	flooding occurs 1 year	straight reaches and inside
on outside bends and	out of 5 or less	banks; numerous slope
are protected by roots	frequently. Outside	failures.
extending into the	banks are actively	
base flow.	eroding with some	
	slope failures.	
7	3	1
	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow. 7	Moderately stable; banks are low; <33% of eroding banks are on outside bends and are protected by roots extending into the base flow.Moderately unstable; banks are high and flooding occurs 1 year out of 5 or less frequently. Outside banks are actively eroding with some slope failures.73

SCORE: 8

### 5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

**SCORE:** 9

### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

### 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

**SCORE:** 6

# 8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1 ·

SCORE: 5

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 7			

**SCORE:** <u>7</u>

# 10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hy

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)			
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
shaded and upstream	>75% shaded in reach and		
2-3 miles generally	2-3 miles upstream poorly		
shaded.	shaded.		
10	. 7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: _8____

#### 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
riparian area, or	to fiparian area.	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): 8.0

Enter score on SC-CPA-52, Water Quality.

- 1. ja If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/08/2009 Stream BQ County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	•
10	7	3	1
SCORE: 8	-		

#### 2. Hydrology Alteration (flooding is out of bank flooding)

	O	EV	
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1 .
COODE -			

**SCORE:** <u>5</u>

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: 8

3

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## 4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: _7____

### 5. Water Appearance

	· · · · · · · · · · · · · · · · · · ·		
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or
	1.5-3 feet; may have slight green color.	heavy green film, or moderate odor of	submerged objects; strong odor of ammonia.
		ammonia.	
10	7	3	1

# SCORE: 6

#### 6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

# 7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
SCODE -				

**SCORE:** <u>7</u>

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover types present.
10	8	5	3	1

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**SCORE:** <u>4</u>

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1

SCORE: _6___

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# 10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pic	kens, Oconee, Greenville Cou	nties above US Hy	wy 11)
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
shaded and upstream	>75% shaded in reach and		
2-3 miles generally	2-3 miles upstream poorly		
shaded.	shaded.		
10	7	`3	1
Warm water fishery (a	ll area of S.C. except as noted	above)	
25,00% of reach shaded $>00%$ shaded: full concerv $< 25%$ of surface shaded in reach			

25-90% of reach shaded.>90% shaded; full canopy.<25% of surface shaded in reach.</th>1071

SCORE: 7

## 11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE:

AVERAGE SCORE (TOTAL SCORE / 11): ____6.6

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landown	er's Name: _	Duke H	Energy	Carolinas	LLC	_Date: _	4/08/2	009	Stream	BR
County:	Cherokee	Count	Y Pre	epared by:	Kriste	en Roop/	Jason	Isbanio	ly	

**INSTRUCTIONS:** Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

#### 1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

		<u> </u>	
Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	_
10	7	3	1
SCODE: 3	4		

SCORE: 3

#### 2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0 years. No dams, no water withdrawals, no dikes or other structures limiting the stream's access to the	once every 3-5 years; limited channel incision. Or withdrawals, although present, do not affect available	once every 6-10 years; channel deeply incised. Or withdrawals significantly affect available low flow habitat for biota.	incised or structures prevent access to floodplain or dam operations prevent flood flows. Or withdrawals have caused severe loss of low flow habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	· 7	3	. 1
SCORE: 4		• · · · · · · · · · · · · · · · · · · ·	

# 3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
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SCORE: <u>8</u>

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4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 5

5. Water Appearance

ct water repetit andee			
Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: _6___

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 9

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 3			

SCORE: <u>3</u>

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.			
shaded and upstream	>75% shaded in reach and					
2-3 miles generally	2-3 miles upstream poorly					
shaded.	shaded.					
10	7	3	1			

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: <u>5</u>

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): <u>5.4</u>

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landown	er's Name:	Duke	Energy	Carolinas,	LLC	Date: 4/	08/200	9	Stream	BS
County:	Cherokee	Count	y Pr	epared by:	Kriste	n Roop/	Jason	Isbanio	ply	

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting	1 I	floodplain.	1
10	7	3	1
CODE 0			·

SCORE: _ 9

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10 ·	7	3	1
SCORE: 3			

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1
SCODE 10		,	

SCORE: <u>10</u>

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	4.1
10	7	3	1

SCORE: 9

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	3	1

SCORE: _ 7

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: <u>8</u>

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1
	· · · · · · · · · · · · · · · · · · ·			-

SCORE: <u>10</u>

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
•				types present.
10	8	5	3	1

SCORE: 7

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 3			

SCORE: <u>3</u>

10. Canopy Cover (Use coldwater or warm water below, not both) Coldwater Fishery (Pickons, Oconeo, Croonville Counties above US H)

To Campy Cover (Ose columner of warm water below, not both)			
Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)			
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.
shaded and upstream	>75% shaded in reach and		
2-3 miles generally	2-3 miles upstream poorly		
shaded.	shaded.		
10	7	3	1

Warm water fishery (all area of S.C. except as noted above)

25-90% of reach shaded. >90% shaded; full canopy. <a> <25% of surface shaded in reach.	
10 7 1	

SCORE: 5

11. Manure Presence

11. Manure Presence			
No livestock accessible to stream,	Evidence of livestock access to riparian area.	Occasional manure in stream; waste storage	Extensive amount of manure on banks or in
riparian area, or	-	structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: 10

AVERAGE SCORE (TOTAL SCORE / 11): 7.4

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

(Modified from Stream Visual Assessment Protocol, December, 1998)

Landowner's Name: Duke Energy Carolinas, LLC Date: 4/09/2009 Stream BT

County: Cherokee County Prepared by: Kristen Roop/ Jason Isbanioly

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	-
10	7	3	1
SCODE 5			

SCORE: <u>5</u>

2. Hydrology Alteration (flooding is out of bank flooding)

	provide a second s	· · · · · · · · · · · · · · · · · · ·	
Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			-
10	7	3	1
SCORE: 4		· · · · · · · · · · · · · · · · · · ·	

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation extends more than 50 feet on each side.	Natural vegetation extends at least 35 feet on each side.	Natural vegetation extends at least 15 feet on each side.	Natural vegetation extends < 15 feet on each side.
10	8	5	1
00000			

SCORE: <u>7</u>

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 5

5. Water Appearance

	Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia.	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
l	10	7	3	1

SCORE: 6

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: _8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types 2-3 cover types		1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.	
10	7 3		1	
SCOPF. 4			·	

SCORE: <u>4</u>

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)

>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: __6

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	'3	1

SCORE: ___

AVERAGE SCORE (TOTAL SCORE / 11): <u>5.6</u>

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 - 8.9	Good
> 9.0	Excellent

STREAM ASSESSMENT PROCEDURE

(Modified from Stream Visual Assessment Protocol, December, 1998)

.

Landown	er's Name: _	Duke	Energy	Carolinas,	LLC	Date:	4/09/2	009	Stream	BU
County:	Cherokee	Count	ty Pr	epared by:	Kriste	n Roop/	Jason	Isbanio	ly	

INSTRUCTIONS: Evaluate a reach of stream equal to about 10 times the average width of the stream. Circle the appropriate score or interpolate between the scores. See the considerations below in completing assessment.

- Ditches may also be assessed if that have perennial or intermittent flow, or if they would qualify for CRP Riparian Forest Buffer.
- Channel widths, depths, and active flood plains are based on bankfull elevations. Bankfull flow corresponds to a 1.5 to 2 years storm event.
- Flood prone areas are based on width at two times the maximum depth of the stream at bankfull flow. If the flow is contained within the channel at two times the maximum depth, then the channel is incised.
- Flooding occurs when the water level reaches the active flood plain. An adequate flood plain is generally 1.5 to 2 times the width of the average stream width at bankfull elevation.

1. Channel Condition (adequate floodplain is generally at least 2 times the channel width)

Natural channel;	Evidence of past channel	Altered channel; <50%	Channel is actively down
no structures,	alteration, but with significant	of the reach with riprap	cutting or widening,
dikes. No	recovery of channel and	and/or channelization.	>50% of the reach with
evidence of down	banks. Any dikes or levees	Excess aggradation;	riprap or channelization.
cutting or	are set back to provide access	braided channel. Dikes	Dikes or levees prevent
excessive lateral	to an adequate floodplain.	or levees restrict	access to the floodplain.
cutting		floodplain.	
10	7	3	1
SCORE: 6			

2. Hydrology Alteration (flooding is out of bank flooding)

Flooding out of bank	Flooding occurs only	Flooding occurs only	No flooding; channel deeply
occurs every 1.5 or 2.0	once every 3-5 years;	once every 6-10 years;	incised or structures prevent
years. No dams, no	limited channel	channel deeply incised.	access to floodplain or dam
water withdrawals, no	incision. Or	Or withdrawals	operations prevent flood
dikes or other	withdrawals,	significantly affect	flows. Or withdrawals have
structures limiting the	although present, do	available low flow	caused severe loss of low flow
stream's access to the	not affect available	habitat for biota.	habitat. Or flooding occurs on
floodplain. Channel is	habitat for biota.		a 1 year rain event or less.
not incised.			
10	7	3	1
CODE 7			

SCORE: __7__

3. Riparian Zone (evaluate general conditions along entire reach, natural vegetation includes hardwood trees, mixed shrubs, and native herbaceous species)

Natural vegetation	Natural vegetation	Natural vegetation	Natural vegetation extends <
extends more than 50	extends at least 35	extends at least 15 feet	15 feet on each side.
feet on each side.	feet on each side.	on each side.	
10	8	5	1

SCORE: <u>10</u>

USDA - NRCS

Wildlife Habitat Incentives Program

4. Bank Stability

Banks are stable; banks are	Moderately stable;	Moderately unstable;	Unstable; banks are high
low and at elevation of	banks are low; <33%	banks are high and	and eroding in some
active floodplain; 33% or	of eroding banks are	flooding occurs 1 year	straight reaches and inside
more of eroding banks are	on outside bends and	out of 5 or less	banks; numerous slope
on outside bends and are	are protected by roots	frequently. Outside	failures.
protected by roots	extending into the	banks are actively	
extending into the base	base flow.	eroding with some	
flow elevation.		slope failures.	
10	7	3	1

SCORE: 6

5. Water Appearance

Very clear; or clear but tea colored; objects visible at depths of 3-6 feet. No noticeable film on surface or submerged objects.	Occasionally cloudy, especially after storm event; but clears rapidly; objects visible at depth of 1.5-3 feet; may have slight green color.	Considerable cloudiness most of the time; objects visible to depth of .5-1.5 feet; submerged objects with heavy green film, or moderate odor of ammonia	Very turbid or muddy appearance most of the time; objects visible to depth <.5 feet; heavy coat of film on surface or submerged objects; strong odor of ammonia.
10	7	2	1
10	/	5	1

SCORE: <u>5</u>

6. Nutrient Enrichment

Clear water along entire reach; little or no algal growth present.	Fairly clear or slightly greenish water along entire reach; moderate algal growth on submerged objects.	Greenish water along entire reach; abundance of green macrophytes, especially during warm months.	Pea green, gray, or brown water along entire reach; thick algal mats in stream.
10	7	3	1

SCORE: 8

7. Barriers to Fish Movement

No barriers; natural drops <1 foot.	Seasonal water withdrawals inhibit movement of fish.	Drop structures, culverts (<1 foot drop) present within reach.	Drop structures, culverts, or dams present within 3 miles of reach.	Drop structures, culverts, or dams (>1 foot drop) present within reach.
10	8	5	3	1

SCORE: _____

8. In-stream Fish Cover (cover types: large woody debris, deep pools, overhanging vegetation, boulders/cobble, riffles, undercut banks, thick root mats)

>7 cover types	6-7 cover types	4-5 cover types	2-3 cover types	1 or less cover
				types present.
10	8	5	3	1

SCORE: _____

9. Pools

Deep and shallow pools abundant (>3); pools at least 5 ft. deep.	Pools present, but not abundant (<3); pools at least 3 ft. deep.	Pools present, but shallow, <3 ft. deep.	Pools absent; entire bottom visible.
10	7	3	1
SCOPE: 2	•	•	

SCORE: 2

10. Canopy Cover (Use coldwater or warm water below, not both)

Coldwater Fishery (Pickens, Oconee, Greenville Counties above US Hwy 11)					
>75% of water surface	>50% shaded in reach; or	20-50% shaded.	<20% shaded in reach.		
shaded and upstream	>75% shaded in reach and				
2-3 miles generally	2-3 miles upstream poorly				
shaded.	shaded.				
10	7	3	1		
Warm water fishery (all area of S.C. except as noted above)					

25-90% of reach shaded.	>90% shaded; full canopy.	<25% of surface shaded in reach.
10	7	1

SCORE: 5

11. Manure Presence

No livestock	Evidence of livestock access	Occasional manure in	Extensive amount of
accessible to stream,	to riparian area.	stream; waste storage	manure on banks or in
riparian area, or		structure located in	stream.
floodplain.		floodplain.	
10	5	3	1

SCORE: _____

AVERAGE SCORE (TOTAL SCORE / 11): ____6.1

Enter score on SC-CPA-52, Water Quality.

If more detailed analysis is needed use:

12. Beck's Index (Stream macro-invertebrates observed; attach data sheet).

< 6.0	Poor
6.1 – 7.4	Fair
7.5 – 8.9	Good
> 9.0	Excellent