ATLANTIC COAST PIPELINE, LLC
ATLANTIC COAST PIPELINE

and

DOMINION TRANSMISSION, INC.
SUPPLY HEADER PROJECT

Supplemental Filing
March 10, 2017

APPENDIX D

North Carolina Revised Fish and Other Aquatic Taxa Collection and Relocation Protocol for Instream Construction Activities

Dominion Resources Services, Inc.
5000 Dominion Boulevard,
Glen Allen, VA 23060

March 10, 2017

BY E-MAIL

Gabriela Garrison and Vann Stancil
North Carolina Wildlife Resources Commission
Sandhills Depot, P.O. Box 149
Hoffman, NC 28347

Re: Dominion Transmission, Inc., Atlantic Coast Pipeline
Submittal of Revised North Carolina Fish and Aquatics Collection and Relocation Protocol for Instream Construction Activities for the Proposed Atlantic Coast Pipeline in North Carolina

Dear Ms. Garrison and Mr. Stancil:

Atlantic Coast Pipeline, LLC (Atlantic) is pleased to provide the revised North Carolina Fish and Aquatics Collection and Relocation Protocol for Instream Construction Activities for the Proposed Atlantic Coast Pipeline (attached). This revised plan describes the methods that Atlantic has agreed to implement to remove fish and other aquatics during construction and incorporates comments received from the NCWRC on 4 January 2017.

As described in the attached revised protocol, Atlantic proposes to implement collection and relocation in two separate categories of streams. Tier 1 streams are those not likely to support rare, threatened or endangered aquatic species. In Tier 1 streams, Atlantic proposes to remove fishes and other aquatics from workspaces *after* the placement of temporary dam structures (e.g., sand bags, sheet piling, etc.). Tier 2 streams are those potentially supporting rare, threatened, or endangered fish and other aquatic species. To reduce impacts to these species, Atlantic proposes to remove them from workspaces *prior* to placement of temporary dam structures. Atlantic requests your comments on the attached revised plan.

Project and Company Background

Atlantic is a company formed by four major U.S. energy companies – Dominion Resources, Inc., Duke Energy Corporation, Piedmont Natural Gas Co., Inc., and Southern Gas Company. Atlantic will own and operate the proposed ACP, an approximately 600-mile-long, interstate natural gas transmission pipeline system designed to meet growing energy needs in Virginia and North Carolina. The ACP will deliver up to 1.5 million cubic feet per day (bcf/d) of natural gas to be used to generate electricity, heat homes, and run local businesses. The underground pipeline project will facilitate cleaner air, increase reliability and security of natural gas supplies, and provide a significant economic boost in Virginia and North Carolina. For more information about the ACP, visit the company's website at www.dom.com/acpipeline. Atlantic has contracted with DTI, a subsidiary of Dominion, to permit, build, and operate the ACP on behalf of Atlantic.

Atlantic looks forward to continued coordination with you on this project. Please contact Mr. Richard B. Gangle at (804) 273-3019 or Richard.B.Gangle@dom.com, if there are questions regarding this protocol. Please direct written responses to:

Richard B. Gangle
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glen Allen, Virginia 23060

Sincerely,

Robert M. Bisha
Technical Advisor, Atlantic Coast Pipeline

Cc: John Ellis, U.S. Fish and Wildlife Service
Sarah McRae, U.S. Fish and Wildlife Service
Judith Ratcliffe, North Carolina Department of Environmental and Natural Resources
Tyler Black, North Carolina Wildlife Resources Commission

Attachments:
Revised North Carolina Fish and Aquatics Collection and Relocation Protocol for Instream Construction Activities

NORTH CAROLINA
REVISED FISH AND OTHER AQUATIC TAXA COLLECTION AND RELOCATION PROTOCOL
FOR INSTREAM CONSTRUCTION ACTIVITIES

10 March 2017

Prepared for:

Environmental Resources Management, Inc.

On behalf of:

ATLANTIC COAST PIPELINE, LLC
Atlantic Coast Pipeline
Docket Nos. CP15-554-000
CP15-554-001

Prepared by:

Environmental Solutions & Innovations, Inc.

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1.0 Introduction

This document describes proposed fish collection efforts to safely remove fish and other aquatic taxa such as mussels, crayfish, turtles, frogs, salamanders and newts (including the Neuse River waterdog) from areas where injury or mortality is likely to occur in streams crossed by the proposed Atlantic Coast Pipeline (ACP or Project) in North Carolina. The methods contained in this document apply to removal efforts associated with any Project-related instream construction activities or disturbance.

2.0 Stream Designation

Waterbodies are categorized into two tiers (i.e., 1 and 2) based on their potential to support rare, threatened, or endangered (RTE) aquatic species. Determination of waterbody designations requires continued coordination with the North Carolina Wildlife Resources Commission (NCWRC) and U.S. Fish and Wildlife Service (USFWS). Streams categorized as Tier 1 are those not likely to support RTE species and Tier 2 are streams potentially supporting RTE species. Species removal method(s), schedule(s), and effort(s) are contingent on the tier designation assigned to each waterbody. In addition to fish, other aquatic taxa such as mussels, crayfish, turtles, frogs, salamanders and newts (including the Neuse River waterdog) will be relocated from the Project workspace. A list of waterbody names and Tier designations are provided in Appendix A.

2.1 Tier 1

Tier 1 streams are those not likely to support RTE aquatic species. Fishes and other aquatics will be removed from workspaces **after** the placement of temporary dam structures (e.g., sand bags, sheet piling, causeways, etc.). Tier 1 removal efforts are specific to dry construction activities. Once the workspace is isolated and prior to dewatering, fish and other aquatics will be removed following methods outlined in Section 4.0 below.

2.2 Tier 2

Tier 2 streams are those potentially supporting RTE fish and other aquatic species. To reduce impacts to RTE species, individuals will be removed from workspaces **prior to** placement of temporary dam structures. Block nets will be installed to exclude fish from entering and exiting the workspace. Once block nets are deployed, the workspace will be cleared of fish and other aquatics following removal methods outlined in section 3.0 below. Once fish and other aquatics have been removed,

instream construction activities (e.g., trenching, dam and pump/flume installation, cofferdam construction, culvert placement, etc.) will commence.

A second species removal effort will be necessary in dewatered areas to ensure/confirm all fishes and other aquatics have been removed. Wet construction techniques (e.g., trenching, open wet-cut, and culvert replacement) employed in waterbodies containing RTE species will also warrant Tier 2 survey methods, and the NCWRC identified North Carolina wet crossing sites requiring Tier 2 removal in comments dated 31 January 2017. Aquatic species removals for wet crossings will occur within all areas of direct impact from construction as well as an appropriate upstream and downstream buffer to account for downstream transport of debris and sediment. The extent of the downstream buffer will be determined in the field and may vary depending on stream width, depth, water velocity, substrate composition, species abundance, and crossing technique.

3.0 Collection Techniques for Fish and Other Aquatics

Sampling will be conducted by qualified personnel experienced in identifying RTE fishes and other aquatic taxa found in eastern North Carolina streams and rivers, and field work will be completed under permits issued by NCWRC. Acceptable and efficient methods used to collect fish and other aquatics include seining, electrofishing, and use of dip nets. These methods will be employed alone or in combination to optimize efficiency and are dependent on site-specific conditions including (but not limited to) water depth, water velocity, elevation gradient, conductivity, substrates, visibility, survey extent, presence of instream habitat features (e.g., woody debris, boulders, bedrock seams, undercut banks, etc.), presence of sensitive taxa, and construction techniques.

3.1 Seining

Seine nets measuring 1.2 to 3.0 meters (4 to 10 ft) long by 1.2 to 1.8 meters (4 to 6 ft) tall with a maximum mesh diameter of 4.8 millimeters (3/16 in) are used to sample fishes in wadeable waterbodies. Certain conditions may warrant the aid of a bag seine. In many cases, three individuals are needed to operate a seine. One individual is positioned at each end of the seine and holds the brail, while an additional individual(s) frees the seine of any snags, ensures the bottom of the seine (lead line) is on the stream bottom, and assists with lifting the seine.

Seines are best used by completing hauls (flowing or static water) or kick sets (flowing water). In areas of low to no flow, individuals holding the brails begin at the bottom of the survey extent working toward an exit point (i.e., streambank, gravel bar,

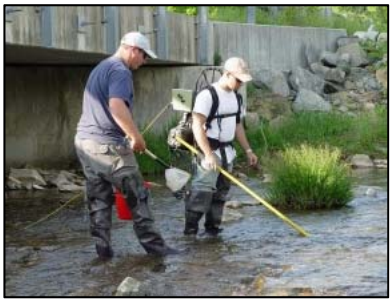
etc.). During each seine haul, the lead line is kept close to the stream bottom, while the top of the seine (float line) is maintained on the water's surface. Each successful seine haul will be recorded as an individual effort.

Kick sets are used in flowing, shallow water, are best suited to target benthic taxa (i.e., madtoms, lamprey, darters, etc.), and involve a stationary seine. Field staff work in a downstream orientation agitating the substrate in an effort to push fish toward the seine. The brails are held perpendicular to the water or obliquely downstream to ensure the float line is not submerged and the lead line is flush with the substrate. Efforts are made to overturn debris and potential cover objects to dislodge fishes and other species from shelter rocks and instream cover. Each kick set will be recorded as an individual effort.

Different, specialized seining techniques may also be used to collect species. For example, in undercut banks, brails may be used to flush out species from instream cover and into the seine prior to lifting the net out of the water. In flowing waters, surveyors may need to haul nets perpendicular to flow. In this case, the individual on the downstream-side of the seine remains slightly ahead of the individual upstream of the seine thus creating a bow in the net and facilitating captures. In small streams, surveyors may need to move slowly with the net spanning the wetted stream width, clearing rocks from the stream bed during each pass while maintaining a bow in the net adequate to accommodate capture of individuals.

3.2 Electrofishing

Pulsed direct current (DC) backpack electrofishing is a safe and efficient fish collection method commonly implemented by fisheries professionals. Standard electrofishing techniques in wadeable streams are calibrated (based on conductivity) and implemented to accommodate site-specific conditions (Bonar et al. 2009). A barge or boat electrofishing unit is appropriate when other conditions (e.g., seining or backpack electrofishing) are deemed ineffective. Boat electrofishing methods are necessary in non-wadeable waterbodies; however, for the purposes of this document, it is assumed that wadeable techniques will be implemented.



A qualified team leader, knowledgeable of electrofishing principles and techniques, will be assigned to lead each crew. Because of the inherent hazards associated with water and electricity, all crew members *must* engage in strict safety standards including use of voltage-rated gloves at all times. Similar to completing seining efforts, a crew of 3 or more is preferred. The size of the survey area, complexity of the stream features, and number of fishes collected are used to define adequate

crew size. Backpack electrofishing requires at least three individuals: one individual to operate the electrofishing unit, while the others net fish and /or hold bucket(s).

Electrofishing is conducted in a side to side or bank to bank sweeping motion moving upstream during low flows with optimal clarity. The minimum effective voltage, pulse width, and pulse rates necessary to achieve the desired response (stunned fish) are used. Efforts to ensure that individuals do not come into contact with the anode are employed. Surveys should begin at the downstream block net and move in an upstream direction toward the end of the survey reach. Surveys in areas isolated from flow are likely to become turbid thereby inhibiting the netter's ability to view stunned fish. Members of the electrofishing team must wear polarized sunglasses to reduce the water's glare and increase detection of species. Multiple passes are made until three passes are completed and yield no additional live individuals. Fish and other aquatics are removed from the electrical field as quickly as possible to minimize inadvertent stress. The downstream block net will be periodically checked for impinged fish. Fish and other aquatics are netted and immediately transferred to clean, oxygenated water in an aerated bucket, or instream holding container. Aerated collection buckets are monitored and changed out frequently to avoid additional stressors resulting from overcrowding. Depending on the season of the surveys, the bucket exchange rate may increase due to elevated ambient and water temperatures. A minimum of two consecutive passes must occur without collection of additional individuals and without evidence of live individuals that have not yet been captured from the collection area before dewatering or construction activities may commence.

3.3 Block Nets

Block nets with a maximum mesh diameter of 4.8 millimeters (3/16 in) are deployed (most often at the upstream and downstream limits of a stream reach) to eliminate species movement in and out of the project workspace. Block nets are secured to the substrate using a combination of rocks, boulders, and sticks. Nets are periodically monitored to remove excessive debris (e.g., leaves, sticks, algae, etc.) buildup and assess that nets are securely positioned to retard fish passage and ensure capture.

3.4 Dip netting

Dip nets with a maximum mesh diameter of 4.8 millimeters (3/16 in) are used in conjunction with other fish collection methods, particularly in shallow water or undercut banks. Dip nets are used at any point of the removal process and are particularly useful during dewatering, facilitating collection of stranded fish from isolated pools.

4.0 Relocation Techniques

Successful depletion of aquatic species within an isolated workspace is affirmed by a significant decline in catch rates concurrent with increased field efforts. This effort is completely achieved once the workspace is dewatered and all species have been removed.

4.1 Handling and Processing

Physical handling of individuals will be minimized to the greatest extent possible. Crew members handling live fishes do so with clean, wet hands, free of chemicals and toxins, such as insect repellent, sunscreen, or lotions. Fishes captured are identified to species, when possible, examined for external anomalies such as deformities, erosion, lesions or tumors (DELTs), and released to the predetermined relocation area. Data are recorded on standardized data sheets.

4.2 Collection and Holding

During species removal efforts, individuals are placed into collection buckets, composed of a non-conductive material (five gallons or larger in size), and the number of fish per bucket is limited to prevent additional stress from overcrowding. Bucket quantity limits are based on the size of the species collected, and buckets are monitored to ensure overcrowding does not occur, particularly of critical concern in summer when dissolved oxygen can be quickly depleted from warm water. Individuals in collection buckets are transferred to holding buckets on the bank containing clean, aerated (oxygenated) water or to perforated containers partially submerged in flowing stream waters.

Individuals held in temporary containers are checked frequently to ensure they are healthy and water conditions are suitable. If individuals are held in buckets for longer than 5 minutes, frequent water changes and battery operated air pumps may be necessary. Collectors should be cognizant of the trophic status and behaviors of fishes collected and recognize the need to segregate predatory species from potential prey species to reduce captive predation. Holding buckets are closely monitored and kept out of the sun to maintain a constant temperature, similar to the habitat from which the fish were collected. Individuals are processed in a timely manner to prevent unnecessary stress and risk of mortality including minimizing physical handling and holding time. A crew member is dedicated to processing fish in a timely manner concurrent with ongoing fish collections completed by others.

4.3 Relocation of Fish and Other Aquatics

Captured fish and other aquatic species will be relocated outside of the workspace; preferably to suitable habitats at least 50 meters (164 ft) upstream from the workspace. The relocation site will be identified based on specific habitat requirements, the species, and size of the species being released. Multiple relocation sites (e.g., mesohabitats) are necessary on occasion to separate species, size, and the numbers of fish relocated. Fish will be released in calm, shallow (< 1 ft deep) waters to facilitate their recovery and reorientation to stream conditions. Large fish are monitored to ensure they remain upright and are able to actively swim. Individuals appearing unlikely to survive or those particularly prone to predation are re-netted and temporarily held in an instream container to help facilitate a full recovery.

Site conditions and the numbers of species captured may warrant the relocation of individuals both upstream and downstream, or relocation at distances farther from capture sites. Preferences for upstream or downstream should be coordinated with a state resource and / or federal agency(s).

4.4 Specimen Vouchering and Agency Notification

Specimen vouchering may be in the form of high-resolution photographs and/or preservation of specimens. In general, only individuals that die accidently during sampling will be preserved as vouchers. Readily identifiable species or individuals greater than 150 millimeters long (5.9 in) are typically photo vouchered. The quantity of specimens vouchered will be kept to a minimum as field effort objectives are primarily focused on safely removing the fishes from harm. Voucher specimens will be fixed in 10 percent formalin solution and transported to the North Carolina Museum of Natural Sciences. Any crayfish that are vouchered will be preserved in 70% ethanol.

The collection of state listed species will be reported within a timely manner. In the unlikely event a federally listed species is encountered, all field efforts will cease immediately and USFWS will be contacted.

5.0 Schedule and Conditions

Seasonality must be considered for any instream construction efforts. Scheduled, instream construction efforts should align with state- or federally- mandated time of year restrictions (TOYRs) associated with the potential presence of fauna in a stream. Previous survey results and collection records will be investigated and the fauna cross-referenced with any corresponding TOYRs.

Preferable fish sampling conditions include normal, low-flow periods with adequate water clarity to maximize sampling efficiencies, catch efficiencies, and enhance detection probabilities of all representative fish species. Because high and low temperature fluctuations increase potential mortality among collected fishes, surveyors must remain cognizant of air temperature effects. At high temperatures, oxygen concentrations in the water are reduced and fishes are subject to hypoxic conditions such that if air temperatures exceed 85 degrees Fahrenheit, sampling and collection efforts may temporarily cease allowing crew members to expeditiously process fishes already collected. Due to increased risk of mortality and stressors associated with temporary husbandry of fishes, extreme care and supplemental measures are likely required if air temperatures drop below 35 degrees or exceed 100 degrees Fahrenheit.

6.0 Reporting

Data required for reporting to the NCWRC Aquatics Database are recorded on standardized data sheets and reporting is completed in a timely manner. Results of each site-specific removal effort will be documented in a comprehensive report. The report will follow a scientific format and include a description of the background information on the Project location, impetus for the field studies, survey methods, personnel, results, and discussion. The text of this report will be augmented with GIS maps where appropriate, field data, and representative photographs.

7.0 Literature Cited

Bonar, S. A., W. A. Hubert, and D. W. Willis. 2009. Standard methods for sampling north american freshwater fishes. American Fisheries Society, Bethesda, Maryland. 335 pp.

APPENDIX A
TABLE OF TIER 1 AND TIER 2 STREAMS IN NORTH CAROLINA

Appendix A: Tier 1 and Tier 2 Streams along the Atlantic Coast Pipeline in North Carolina

Waterway[1]	Basin	County	Crossing Method[2]	Tier	Concerns
Jacks Swamp 1	Roanoke	Northampton		2	Banded Sunfish
Jacks Swamp 2	Roanoke	Northampton		2	Banded Sunfish
Cypress Creek 1	Roanoke	Northampton		2	Banded Sunfish
Cypress Creek 2	Roanoke	Northampton		2	Banded Sunfish
Cypress Creek 3	Roanoke	Northampton		2	Banded Sunfish
Roanoke River	Roanoke	Northampton, Halifax	HDD	NA	
Little Quankey Creek	Roanoke	Halifax		1	
Quankey Creek	Roanoke	Halifax		1	
Marsh Swamp	Tar	Halifax		1	
Beaverdam Swamp	Tar	Halifax		1	
Burnt Coat Swamp	Tar	Halifax		1	
Jacket Swamp	Tar	Halifax		1	
Rocky Swamp	Tar	Halifax		1	
Fishing Creek	Tar	Halifax, Nash	HDD	NA	Neuse River Waterdog
Black Swamp	Tar	Nash		1	
Swift Creek	Tar	Nash	HDD	NA	Neuse River Waterdog
Flat Rock Branch 1	Tar	Nash		1	
Flat Rock Branch 2	Tar	Nash		1	
Pig Basket Creek	Tar	Nash		2	Mimic Shiner
Stony Creek	Tar	Nash		2	Mimic Shiner & Neuse River waterdog
Little Sapony Creek	Tar	Nash		2	Mimic Shiner and Ironcolor Shiner
Sapony Creek	Tar	Nash		2	Mimic Shiner and Ironcolor Shiner
Tar River	Tar	Nash	HDD	NA	Neuse River Waterdog
Toisnot Swamp	Neuse	Nash		2	Blackbanded Sunfish and Ironcolor Shiner
Millstone Creek	Neuse	Wilson		1	
Marsh Swamp	Neuse	Wilson		1	
Marsh Swamp UT	Neuse	Wilson		1	
Contentnea Creek	Neuse	Wilson	HDD	NA	Neuse River Waterdog
Little Buffalo Creek	Neuse	Johnston		2	Banded Sunfish and Ironcolor Shiner, Neuse River Waterdog
Little River	Neuse	Johnston	HDD	NA	Neuse River Waterdog
Little Creek	Neuse	Johnston		1	
Polecat Branch and AR	Neuse	Johnston		1	
Neuse River	Neuse	Johnston		2	Sturgeon Critical Habitat, Neuse River Waterdog
Hannah Creek	Neuse	Johnston		2	Ironcolor Shiner
Whiteoak Branch	Neuse	Johnston		2	Ironcolor Shiner
Stone Creek	Neuse	Johnston		2	Ironcolor Shiner
Johnson Swamp	Neuse	Johnston		2	Ironcolor Shiner
Johnson Swamp UT	Neuse	Johnston		1	
John K. Swamp	Neuse	Johnston		1	
Beaverdam Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Beaverdam Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Beaverdam Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Starlins Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Starlins Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Mingo Swamp	Cape Fear	Sampson		2	Blackbanded Sunfish
Black River/South River	Cape Fear	Cumberland		2	Blackbanded Sunfish, Ironcolor Shiner, Broadtail Madtom
UNT to Cedar Creek	Cape Fear	Cumberland		2	Banded Sunfish
Big Marsh Swamp	Lumber	Robeson		2	Blackbanded Sunfish, Santee Crayfish
Tenmile Swamp	Lumber	Robeson		2	Santee Crayfish
Saddletree Swamp	Lumber	Robeson		2	Blackbanded Sunfish, Ironcolor Shiner
Raft Swamp	Lumber	Robeson		2	Santee Crayfish
Richland Swamp	Lumber	Robeson		2	Ironcolor Shiner, Santee Crayfish
Burnt Swamp	Lumber	Robeson		2	Ironcolor Shiner, Santee Crayfish

[1] UT = Unnamed Tributary

[2] HDD = Streams traversed via Horizontal Directional Drilling