

ENCLOSURE D PROJECT IMPACTS

A. Impacts on Designated Resources

Construction and operation of linear infrastructure Projects, including the proposed Atlantic Sunrise Project (Project) inevitably impact designated resources, including wetlands and watercourses. The Project has been designed to avoid and minimize impacts to environmental as well as recreational resources. The following discussion, as well as the Alternatives Analysis provided in **Attachment P-1**, details the Project's potential impacts and the avoidance and minimization measures that Transco has taken thus far and will take in during construction and operation of the Project to protect designated resources. Additionally, the Comprehensive Environmental Evaluation for the Central Penn Line provided in **Appendix L-1** presents a summary of the alternatives analysis for the Project as whole.

Transco has sited the proposed compressor, meter and regulating stations, and other minor aboveground appurtenances, such as main line valves (MLVs) and pig launcher and receiver facilities and communications towers, outside of wetlands and watercourses. Therefore, no direct impacts or losses to wetlands or watercourses are expected to result from construction and operation of the aboveground facilities.

Potential impacts associated with the Project on national and/or state forests, park lands, wildlife refuges, game lands, and/or wildlife sanctuaries were identified for the construction and operation of the Project within **Columbia County**. Information regarding potential impacts to national, state, or local historic sites and cultural or archaeological landmarks within the Project area was coordinated through the Pennsylvania Historical Museum Commission (PHMC). Threatened and endangered species coordination effort was conducted through the applicable federal and state agencies. ~~Field studies were conducted on the portions of the line for which survey access was granted by landowners. Additional portions of the line, which are currently designated as no-access parcels, will be surveyed in the future. Field studies were conducted within 100 percent of the Project area within Columbia County.~~

A1. National, State or Local Park, Forest or Recreation Area

There are no impacts to National, State, or Local Parks, Forests or Recreation Areas as a result of the Project in Columbia County.

A2. Natural, Wild, or Wilderness Area

No impacts to Natural, Wild or Wilderness Areas are expected to occur within Columbia County.

A3. National, State, or Local Historic Site

Section A6 provides a summary of potential impacts to historic, cultural and archaeological resources.

A4. National Natural Landmark

There will be no impacts to national natural landmarks as a result of the portion of the Project within Columbia County.

A5. National Wildlife Refuge

There will be no impacts to national wildlife refuges as a result of the portion of the Project within Columbia County.

A6. Cultural or Archeological Landmarks

On May 1, 2014, Transco met with staff of the PHMC to discuss the Project, cultural resource impacts, and proposed cultural resources investigations. Transco also requested that, for the purpose of facilitating review of archaeological resources that a process developed for other natural gas Projects in Pennsylvania aimed at providing regular Determinations of Eligibility for archaeological resources be implemented. This process involves routine updates on the eligibility status of archaeological resources identified during Phase I surveys. Since this initial meeting, Transco's coordination and consultation with the PHMC has been on-going.

A Transco-sponsored open house was held for the Project facilities in Columbia County at the Bloomsburg Fire Department Social Hall on June 5, 2014. Public comment from several landowners was received on potential cultural issues, all of which were examined and addressed during the cultural resources field reconnaissance for the Project. In

addition to the open house, consultation was initiated with the Columbia Historic Preservation Society concerning cultural resources in Columbia County. The historical society did not respond with any comments on the proposed Project.

The Phase I archaeological field reconnaissance of the CPL-North study corridor in Columbia County resulted in the identification of four archaeological resources, while an additional 16 archaeological resources were identified on the CPL-South study corridor in Columbia County. Nineteen of these 20 archaeological resources represent low-frequency/ephemeral surface and plowzone artifact scatters displaying limited potential for intact, significant archaeological deposits, and were all recommended as Not Eligible for the National Register of Historic Places (NRHP). The PHMC determined, in various correspondence in 2014, 2015, and 2016, that no further work would be necessary for any of these 19 locations prior to construction of the Project. A single archaeological resource on CPL-South was determined Potentially Eligible for intact archaeological deposits, and subjected to Phase II NRHP testing. Upon completion of testing, the PHMC determined the resource as Not Eligible for listing in the NRHP in the concurrence letter dated 14 July 2016.

A total of 111 aboveground resources were identified during the Architectural History survey conducted for Project land requirements in Columbia County; 94 of these resources are currently located within the Project, while an additional 17 resources were identified on parcels subsequently removed from the Project APE (due primarily to changes in the Project alignment). Transco recommended six of the resources as Eligible and two of the resources as Potentially Eligible for the NRHP. PHMC review concluded that four of the six resources submitted as Eligible were actually Eligible, while two of the resources were Not Eligible. PHMC also determined that the two resources submitted as Potentially Eligible were not Potentially Eligible. PHMC determined that the remaining 86 resources had no anticipated effects from the Project.

The geomorphological desktop study identified five drainage crossings in Columbia County which display the potential for containing deeply buried cultural deposits: Mugser Run, Hemlock Creek, Fishing Creek, Roaring Creek and the Susquehanna River. Deep testing was completed on the north bank of Mugser Run, and no testing was warranted on the south bank. No additional geomorphological testing is needed at either location. Phase I

shovel testing on the north bank of Roaring Creek determined further testing was not warranted, while deep testing excavations were completed on the south bank. No additional geomorphological investigations are necessary at this location. At the Columbia County Crossing of the Susquehanna River, Phase I shovel testing on the west bank determined further deep testing was not required. No deep testing was warranted on the east bank of the river due to the planned HDD at this location. Because of the proposed HDD, additional geomorphological testing at this crossing is not necessary. Phase I shovel testing at the Hemlock Creek crossing determined further deep testing was not warranted, and no additional geomorphological investigations were needed. Deep testing was also completed at the Little Fishing Creek crossing, and the PHMC concurred that no additional investigations are warranted at this location.

Additional cultural resources fieldwork is projected in Columbia County, on realigned and previously-inaccessible tracts of the CPL-South loop. **Attachments D-1 and D-2** provide a summary of consultation with PHMC and copies of correspondence, respectively.

A7. State Game Lands

There are no State Game Lands crossed by the Project within Columbia County.

A8. Federal, State, Local or Private Plant or Wildlife Sanctuaries

There will be no anticipated impacts to federal, state, local or private plant or wildlife sanctuaries as a result of the portion of the Project within Columbia County.

A9. Areas Identified as Prime Farmland

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service (NRCS), in cooperation with other interested federal, state, and local government organizations, has inventoried land that can be used for production of the nation's food supply. Important farmlands consist of prime farmland, unique farmland, and farmland of statewide or local importance. It should be noted that not all important farmland soils are used for farming. NRCS makes important farmland designations based on soil properties, not on current or past use.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, (e.g., tree nuts, cranberries, and other fruits and

vegetables). It has the unique combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed.

Farmlands of statewide importance generally include those areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Farmland locations that are not identified as having national or statewide importance can be designated by local agricultural agencies as farmland of local importance for the production of food, feed, fiber, forage, and oilseed crops.

Approximately 23.8 miles of the Project will cross Prime Farmlands or Farmlands of Statewide Importance in Columbia County. Pipeline construction may result in temporarily removing farmland soils from agricultural production if construction occurs during the growing season. Pipeline construction and operation will not result in any long-term loss of prime and important farmland. Soils that are currently designated as prime farmland and farmland of statewide importance will retain their designation both during and after construction. Effects on agricultural soils, including prime and important farmland soils, will be mitigated according to the Agricultural Plan and the Transco Plan, provided respectively as Attachments 6 and 17 of the Transco Environmental Construction Plan (ECP) (**Attachment M**). While some short-term decreases in agricultural productivity may result because of the disturbance of soil during construction, those effects can be mitigated over time by the restoration measures previously discussed and by resumption of proper soil management by landowners.

Construction of the contractor/pipe yards and contractor staging areas will temporarily effect prime and important farmland soils. Pipeline operation will not adversely affect agricultural soils, including prime farmland and farmland of statewide importance. Construction of Compressor Station 610 will result in the permanent loss of approximately 32.6 acres of prime farmland and/or soils of statewide importance. Additionally, construction of West Diamond Regulator Station will result in the permanent loss of approximately 4.3 acres of prime farmland and/or soils of statewide importance. The impacts as a result of these facilities will not be mitigated.

The Project crosses conservation easements Columbia County including Agricultural Security Areas (ASA) and Conservation Reserve Enhancement Program (CREP) easements. Transco conducted title searches to identify all easements crossed by the Project facilities and these easements are identified in Table L(d)-1 and Table L(d)-2.

A conservation easement is a type of contract that functions like a deed restriction and restricts real property to uses and improvements that are compatible with the stated conservation purposes of the conservation easement. The existence of a conservation easement recorded against the title to a tract of land does not necessarily prohibit all development of the land. A typical conservation easement, even if intended to protect agricultural use, may specifically allow one or more residences, farm buildings, driveways, aboveground and belowground utilities, and other structures, even though these activities and improvements will convert some of the land to nonproduction use and reduce some of the agricultural production potential of the property. Uses that are not prohibited by a conservation easement are also permitted.

TABLE L(d)-1 Pennsylvania Conservation Easements Crossed by the Atlantic Sunrise Project in Columbia County					
Facility	Easement Type	Begin Milepost	End Milepost	Land Affected During Construction (acres)	Land Affected During Operation (acres)
CPL South					
Columbia County					
PA-CO- 056.000	ASA	97.9	M-0174 0.1	5.3	2.0
PA-CO- 057.000	ASA	M-0174 0.4	98.8	12.4	4.8
PA-CO- 154.000	ASA	109.5	109.6	2.4	0.9

TABLE L(d)-2 Conservation Reserve Program/Conservation Reserve Enhancement Program Properties Crossed by the Atlantic Sunrise Project in Columbia County			
Facility/County/Tract	CRP/CREP	Begin Milepost	End Milepost
CPL North			
Columbia County			
PA-CO-276.000	CREP	2.6	2.7
CPL South			
Columbia County			
PA-CO-215.000	CREP	118.3	118.6
PA-CO-218.000	CREP	119.0	119.2

Agricultural Security Areas and Agricultural Conservation Easements

An ASA is a unit of land of 250 or more acres reserved for agricultural production of crops, livestock, or livestock products that have been designated as such under Pennsylvania Code 1967 P. L. 992, No. 442 and 32 P. S. § § 5001–5012. ASA lands are provided protection from laws prohibiting agricultural activities. An ASA designation does not prohibit the landowner from developing oil or gas on the land. Therefore, construction and operation of the pipeline facilities will not affect the classification of the ASA parcels.

An agricultural conservation easement is a protection placed on a land that provides the landowner the right to prevent development or improvement of a parcel for any purpose outside of agricultural production (PFPA 2012). Such easements may be sold or donated by a landowner to the state, county, local government, or local land trust. For a parcel to qualify for an agricultural conservation easement, it must first be designated as an ASA. ASA lands are designated by local municipalities upon the request of landowners to promote permanent and viable farming operations. Owners of ASA lands may apply for the purchase of an agricultural conservation easement to receive preferential zoning treatment. The ASA designation does not restrict the use of the property, which can be developed in any manner authorized by local ordinances and regulations. The existence of utility facilities does not prevent land from being designated as an ASA or agricultural conservation easement.

Conservation Reserve Enhancement Program

The CREP is a federal/state natural resource conservation program established to improve the water quality of the Chesapeake Bay. The program is part of a larger effort to address state and nationally significant agriculture-related environmental problems. The Pennsylvania CREP is managed jointly by the FSA and the Commonwealth of Pennsylvania, although numerous other federal and state agencies and private conservation groups are partners in the program (USDA 2011; Pennsylvania CREP 2016). The program helps farmers improve the water quality of the upper and lower Susquehanna and lower Potomac River basins by reducing sediment, livestock manure, and other nutrient runoff to the Chesapeake Bay. These efforts help to lower water temperatures, increase dissolved oxygen levels, and provide additional wildlife habitat in the Chesapeake Bay and its watershed (USDA 2011).

CREP was authorized under the Food Security Act of 1985, as amended, and was first announced in April 2000. The program initially targeted a total voluntary enrollment of 100,000 acres of land in 20 counties in the lower Susquehanna and Potomac River basins, including lands in Columbia, Lancaster, Lebanon, Northumberland, and Schuylkill counties. The program has expanded to include an additional 100,000 acres in 23 northern tier counties in Pennsylvania, including Luzerne, Lycoming, Susquehanna, and Wyoming counties (USDA 2011). Through CREP, program participants receive financial incentives from the U.S. Department of Agriculture to voluntarily enroll in the program for contracts of 10 to 15 years. Participants remove cropland or marginal pastureland from agricultural production and convert the land to native grasses, trees, and other vegetation (USDA 2011; Pennsylvania CREP 2016).

Properties enrolled in the CREP Programs crossed by the Project in Columbia County are identified in Table L(d)-1. Transco is working with the NRCS, local FSA agents, and landowners to obtain information on CREP properties in the Project area. Where the ROW crosses CREP acreage, Transco will reseed based on each landowner's conservation plan filed at the local NRCS office. Seeding rates and species selection for CRP acreage will be determined based on the each conservation plan. Transco will work with the NRCS and landowners to make sure that all CRP acreage is identified and that the appropriate seed mix is planted on individual acreage.

Transco will restore agricultural properties with conservation easements in accordance with the methods described in the Transco Agricultural Plan provided as Attachment 6 of the Transco ECP (**Attachment M**).

B. Impacts on the Aquatic Environment

B1. Aquatic Habitats

All temporary impacts to aquatic resources are related to the construction of the pipeline. All permanent impacts to aquatic resources are related to the removal of vegetative cover for operation. No fill or impervious cover will be added to aquatic resources as part of this Project. Operational right-of-way (ROW) will be maintained for a width of 10-feet at watercourse approaches and through palustrine emergent (PEM) and palustrine scrub-shrub (PSS) wetlands, and for a width of 30-feet through palustrine forested (PFO) wetlands. Transco is proposing the construction ROW widths to provide for safe and efficient construction of large-diameter pipeline facilities in accordance with Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1926.650-1926.652, Subpart P) and Interstate Natural Gas Association of America's (INGAA) workspace guidelines (INGAA 1999). Reductions of the construction ROWs will be made, where practicable, at various locations to address specific environmental or residential issues along the proposed pipelines. The impact analysis included in this section is related to resources associated with the Pennsylvania Department of Environmental Protection (PA DEP) Chapter 105 jurisdictional areas.

The proposed Project extends through 46 special protection watersheds (e.g., High Quality or Exceptional Value) and watersheds that are considered siltation impaired. As a result, an anti-degradation analysis was prepared for the Project and a detailed listing of each watershed, cause of siltation, and location it will be crossed is provided for Columbia County within **Attachment M**. Additionally, the Comprehensive Environmental Evaluation for the Central Penn Line provided in **Appendix L-1** presents a summary of the anti-degradation consistency analysis for the Project as whole.

The Project will affect **71 73** streams, **79 86** floodways, and **54-56** wetlands within Columbia County. Per PA DEP guidance, the installation of a pipe under streams is considered a permanent impact. Please note that the total count of wetlands affected is based on cover types, such that a single wetland complex could have multiple wetland counts. For example, a single wetland complex comprised of PEM, PSS, and PFO cover types was counted as three wetland crossings for the purpose of impact presentation in this Application. Tables summarizing the overall impacts on waterbodies and wetlands for

the Project as a whole are included in the Comprehensive Environmental Evaluation for the Central Penn Line in **Appendix L-1**.

Through the implementation of the ECP, including the Best Management Practices (BMPs), water quality impacts are expected to be minimized to the extent practicable during construction, and no long term water quality impacts are expected to occur. Prior to conducting any in-stream work, all associated BMPs shall be installed and functional. BMPs will be installed at the edge of work areas, as necessary, to prevent siltation into wetlands in the vicinity of construction activities and will be maintained throughout the period of the construction activities. Wetland and watercourse boundaries will be clearly marked prior to construction activities.

Restoration of streams will involve, at a minimum, restoring each stream to pre-construction contours and revegetating surface water banks and riparian areas in accordance with the **Riparian Area Impact Assessment and Restoration Plan for the Project area in Columbia County provided in Appendix L-2**. In wetland areas, restoration activities will involve returning wetlands to pre-construction contours and seeding in non-inundated areas with an approved wetland seed mix. In general, hydrologic conditions are not anticipated to be impacted as a result of Project construction.

Transco has incorporated the following avoidance and minimization measures to reduce impacts to aquatic resources.

Erosion and Sediment Controls

Construction activities can disturb surface soils and cause subsequent sediment transport into adjacent wetlands. Sedimentation will be minimized by the installation of temporary sediment control measures between the upland construction areas and the wetlands. Permanent erosion controls, including slope breakers, trench breakers, and vegetative cover, will be used in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of slope breakers to minimize erosion of soil off the ROW into wetlands. Trench plugs will be installed in upland slopes adjacent to wetlands to prevent trench erosion. Trench plugs also will be spaced in accordance with the applicable state and federal regulations and

installed at the edges of the wetland and on either side of watercourse crossings to prevent subsurface drainage along the pipeline.

To minimize erosion and promote revegetation within the wetland, removal of the root mats for woody vegetation will be allowed only directly over the trench area or where required to ensure safe working conditions. This serves to enhance regeneration of vegetation on the construction and permanent ROW. Permanent erosion control structures that could alter hydrology (e.g., slope breakers) will not be installed within wetlands, but these structures will be used in the adjacent upland areas to control erosion and sedimentation. Transco will employ BMPs as specified in erosion and sediment control permits and approved by PA DEP to further minimize the potential for soil compaction.

Turbidity and sedimentation could result from in-stream construction activities, trench dewatering, and/or construction-related stormwater runoff. In slow-moving waters, increases in suspended sediments could increase the biological oxygen demand and reduce levels of dissolved oxygen in localized areas during construction. Suspended sediments also could alter the chemical and physical characteristics of the water column on a temporary basis.

Transco will cross surface waters with flowing water present at the time of construction using dry-ditch construction methods to the greatest extent practicable. Dry-ditch crossing and trenchless watercourse crossing methods can dramatically reduce downstream sediment transport effects compared to wet open-cut crossings (Reid and Anderson 1999). Transco will employ BMPs as specified in its Erosion and Sediment Control General Permit 2 (ESCGP-2) application, which contains a site-specific erosion and sediment control plan to further minimize the potential for soil compaction (see **Attachment M** - provided under separate cover).

Transco will also install temporary equipment bridges across surface waters to reduce the potential for turbidity caused by movement of construction equipment and vehicular traffic. Equipment bridges will be constructed of timber mats, or portable prefabricated bridges, depending on surface water conditions (e.g., if excessively soft soils are encountered in the surface water bed, or if high water flows occur, portable bridges will be used at minor surface water crossings). Typical drawings for equipment bridges are provided in

Attachment 2 of the Transco ECP (**Attachment M**). Equipment bridges will be maintained until the pipe is installed and they are no longer needed. The bridges will then be removed. Equipment bridges will be designed to accommodate normal to high surface water flow and will be maintained to prevent flow restriction during the period of time the bridge is in use during construction.

To minimize sedimentation during pipeline construction across watercourses, trench spoil will be placed at least 10 feet away from water's edge, unless impractical due to topography, as specified in the Transco Procedures (Attachment 18 of the Transco ECP [**Attachment M**]). Erosion controls will be placed around spoil piles to prevent sediment from flowing into surface waters. Additional Temporary Workspace (ATWS) will typically be set back 50 feet from the water's edge unless otherwise approved by the Federal Energy Regulatory Commission (FERC) and the United States Army Corps of Engineers (USACE) (**see Attachment P-1, Appendix P-1**). **Appendix P-1 to Attachment P includes a description of the LOD for each wetland and watercourse impact proposed for the Project within Columbia County, including site-specific justification for the required LOD and pipeline siting considerations.**

Once the pipe is placed in the trench, the excavated material will be replaced immediately, and the surface water banks and bed will be restored to preconstruction contours. To stabilize the banks, the surface water banks and riparian areas will be revegetated using approved seed mixes and/or erosion control blankets or matting in accordance with the **Riparian Area Impact Assessment and Restoration Plan for Columbia County within Appendix L-2.**

Compaction

Compaction of wetland soils and rutting within wetlands will be minimized by using low-ground-pressure equipment and temporary equipment mats. In general, rutting of soils, which is a sign of compaction, in wetlands or in other areas during wet conditions will be avoided or minimized through the use of timber mats as deemed necessary during construction or by postponing work until soils have dried. In addition, Transco will minimize compaction of soils within agricultural lands, residential areas, and not saturated or inundated wetlands by stripping, segregating, and stockpiling topsoil separately from subsoil during construction. The Transco Procedures (ECP Attachment 18, provided within

Attachment M of this Application) (Transco Procedures) and Agricultural and Construction Monitoring Plan (ECP Attachment 6, provided within **Attachment M** of this Application) indicate that the top 12 inches of topsoil from wetland and agricultural areas disturbed by trenching will be segregated from subsoil, except in areas where standing water is present, soils are saturated, or where shallow depth to bedrock conditions exist. These exceptions will be identified via visual assessment during grading and documented in the field with the Environmental and/or Agricultural Inspector. Immediately after backfilling is complete, the segregated topsoil will be restored to its original horizon location. Restoration of the soil surface elevations and contours and revegetation will be performed in accordance with Transco's ECP (**Attachment M**). Backfilling will occur to approximate grade; however, a soil crown may be placed above the trench to accommodate future soil settling.

If compaction occurs during construction, Transco will also use subsurface decompaction techniques, as described in the Transco Agricultural Construction and Monitoring Plan within Attachment 6 of Transco's ECP (**Attachment M**). Transco will employ BMPs as specified in erosion and sediment control permits and approved by the PA DEP to further minimize the potential for soil compaction.

Hydrology

Stream crossings are to be performed during low flow conditions with oversight from an environmental inspector. Storm event weather forecasts will be monitored prior to and during the stream crossing. The contractor will be required to maintain an adequate number of pumps on-site to facilitate an unanticipated increase in stream flow.

Per the Transco Procedures, provided as Attachment 18 of the ECP (**Attachment M**), the following additional measures for dam-and-pump watercourse crossings will be implemented:

- Use sufficient pumps, including on-site backup pumps, to maintain downstream flows;
- Pumps will be properly aligned to prevent surface water bed scour at the pump discharge;
- Dams will be constructed with materials that prevent sediment and other pollutants from entering the watercourse;
- Pump intakes will be screened to minimize entrainment of fish; and,

- Dams and pumps will be continuously monitored to ensure proper operation throughout the watercourse crossing.

Per the Transco Procedures, provided as Attachment 18 of the ECP (**Attachment M**), the following additional measures for flume crossings of watercourses will be conducted:

- Sand bags, sand bag and plastic sheeting diversion structures, or the equivalent will be used to develop an effective seal and to divert stream flow through the flume pipe;
- Flume pipes will remain in place until trenching, pipe laying, backfilling, and initial streambed restoration efforts are complete;
- Flume pipes will be properly aligned to prevent bank erosion and streambed scour; and
- All flume pipes and dams that are not part of the equipment bridge will be removed as soon as final cleanup of the streambed and bank is complete.

Permanent changes in surface and subsurface hydrology along the pipeline alignment through a wetland can have a long-term effect on hydrology and associated function and value. Trench plugs will be installed at the entrance and exit of the pipeline through each wetland to ensure that the subsurface hydrology remains intact. Restoration of each wetland will include returning contours to preconstruction levels (within 6 inches) and removing temporary erosion control measures.

Trench Dewatering

During construction, the open trench could accumulate water, either from the seepage of groundwater or from precipitation. This water must be removed from the trench to allow construction to proceed. During trench dewatering, water will be pumped from the trench and discharged into vegetated upland areas after first being filtered through a straw bale structure and/or filter bag. The rate of flow from the pump will be regulated to prevent scouring from runoff. Dewatering will be conducted in a manner designed to prevent the flow of heavily silt-laden water directly into adjacent surface waters or wetlands and will be performed in accordance with the PA DEP and USACE permit requirements and the FERC Order.

Blasting

Transco anticipates the use of blasting in bodies of water or watercourses; however, Transco will not know for certain until construction activities commence. Watercourses with a higher potential for blasting are those with shallow depth to bedrock, as indicated in Table L(d)-3. Transco's construction contractor will be required to demonstrate that blasting is required by first attempting to remove bedrock material using mechanical means, such as a hydraulic ram or splitter, rock trenching machine, or rock saw. Transco has submitted an Application for use of Explosives in Commonwealth Waters to the Pennsylvania Fish and Boat Commission (PFBC) for each proposed stream crossing in the event that blasting of bedrock is required to properly install the pipe.

Atlantic Sunrise Project – PA DEP Chapter 105 Joint Permit Application
 Transcontinental Gas Pipe Line Company, LLC
 Columbia County

**Table L(d)-3
 Watercourses with Shallow Depth to Bedrock Crossed by the Atlantic Sunrise Project in Columbia County**

Waterbody ID	Waterbody Name ^a	Approximate Milepost ^b	Latitude	Longitude	Municipality	Stream Type	Crossing Length (feet)	Water Quality Classification ^c	Fishery Classification ^d	Crossing Method ^e
WW-T02-15004	UNT to Fishing Creek	0.93	41.27342	-76.38915	Sugarloaf	Intermittent	161.88	CWF, MF	Wild Trout Waters	II
WW-T02-15009	UNT to Fishing Creek	2.30	41.27615	-76.36351	Sugarloaf	Intermittent	7.04	CWF, MF	Wild Trout Waters	II
WW-T04-12002	UNT to Montour Run	101.61	40.97652	-76.49814	Montour	Intermittent	10.74	CWF, MF	None	II
WW-T17-14002	UNT to York Hollow	123.12	41.24974	-76.42543	Jackson	Intermittent	10.22	CWF, MF	Wild Trout Waters	II
WW-T91-15004	UNT to Fishing Creek	M-0086 0.21	41.27558	-76.36431	Sugarloaf	Intermittent	11.91	CWF, MF	Wild Trout Waters	II
WW-T02-15002	UNT to Fishing Creek	0.59	41.27303	-76.39555	Sugarloaf	Perennial	5.57	CWF, MF	Wild Trout Waters	II
WW-T02-15008	UNT to Fishing Creek	1.99	41.27497	-76.36928	Sugarloaf	Perennial	5.07	CWF, MF	Wild Trout Waters	II
WW-T17-14001	UNT to York Hollow	122.62	41.24264	-76.42670	Jackson	Perennial	10.60	CWF, MF	Wild Trout Waters	II
WW-T70-12011	UNT to Fishing Creek	M-0423 3.00	41.01519	-76.47630	Hemlock	Perennial	10.91	CWF, MF	None	II

a: UNT: Unnamed Tributary. UNT name was identified based on review of USGS topographical mapping.
 b: Milepost provided for access roads indicate the point at which the access road meets the proposed pipeline.
 c: PA Water Quality Classification Definition: CWF = Cold Water Fishery; HQ = High Quality; WWF = Warm Water Fishery; EV = Exceptional Value; MF = Migratory Fishery (Chapter 93 Pennsylvania Code). Water quality classifications were identified through a desktop review of available GIS data layers. A waterbody that was not assigned a water quality classification on the GIS data layer was given the same classification as the waterbody it drains into. All water quality classifications shown are designated uses, no existing uses are present in the Project area.
 d: N/A = Not Applicable, no state fishery classification; TS = Trout stocked; PA Fishery Classifications: Approved trout waters; Class A Wild Trout Waters, Wild Trout Waters, WWCW Fisheries Streams (PFBC 2014a, 2014b, and 2014c).
 e: II = Dry Crossing Method, including Flume, Dam and Pump, or Dry Open Cut for waterbodies that are dry at the time of crossing.

In general, if blasting is required at a watercourse crossing, the preparation of the rock for blasting (i.e., drilling shot holes) will not cause sufficient disturbance to displace aquatic organisms and will not increase surface water turbidity, since dry crossing methods will be utilized at each crossing. If in-water blasting is deemed necessary, Transco will implement its Blasting Plan, provided as Attachment 10 of the Transco ECP (**Attachment M**), and the site-specific blasting plan that will be produced for each area requiring blasting, which specifically addresses in-water blasting. In addition, Transco will obtain the required permits, licenses, and approvals and notify agencies in accordance with permit requirements. The Blasting Plan outlines proper precautions and necessary pre-blast planning to be implemented to minimize potential effects. Transco's contractor will also create a detailed, site-specific blasting plan for each area proposed for blasting; each site-specific blasting plan will be consistent with the provisions of the Project-specific Blasting Plan. Immediately following blasting, Transco will remove rock that impedes surface water flow. Furthermore, Transco will implement a two-foot depth of cover within consolidated rock to minimize the amount of blasting required and the duration of construction activity within the affected watercourse.

Spill Control

Inadvertent spills of fluids used during construction, such as fuels, lubricants, and solvents, could contaminate wetland soils and have adverse impacts on wetland vegetation. The Spill Plan for Oil and Hazardous Materials (Transco Spill Plan), provided as Attachment 9 of the Transco ECP (**Attachment M**), will be implemented to minimize the potential for spills and minimize effects from spills. In general, storage of equipment, hazardous materials, chemicals, fuels, lubricating oils, will occur at least 100 feet from wetlands, watercourses, and bodies of water. The Horizontal Directional Drill (HDD) Contingency Plan in Attachment 3 of the ECP (**Attachment M**) addresses inadvertent returns.

Fuel spills that occur during construction, although unlikely, could result in toxicity to aquatic organisms and associated modifications of aquatic habitat, as well as decreased oxygen concentrations. The Transco Spill Plan describes measures that will be implemented by Transco personnel and its contractors to prevent and, if necessary, control any inadvertent spill of hazardous materials that could affect water quality. The Transco Spill Plan will be updated with site-specific information prior to the initiation of construction activities. Hazardous materials, chemicals, lubricating oils, and fuels used during

construction will be stored in upland areas at least 100 feet from surface waters unless otherwise approved by applicable regulatory agencies, and refueling of construction equipment will be conducted at least 100 feet from surface waters unless otherwise approved by applicable regulatory agencies. Additional precautions such as continual monitoring of fuel transfer and use of spill kits will be employed. Disposal of hazardous materials will also be conducted in accordance with the Transco Spill Plan.

Revegetation

Some wetland vegetation will be cut, removed, or crushed during construction. After the completion of construction, wetland areas within the ROW will be restored to preconstruction contours and revegetated with where standing water is not present to stabilize disturbed soils. For the pipeline construction ROW and ancillary facilities, Transco proposes to utilize either winter wheat or annual ryegrass as a nurse crop on the ROW from January 1 through May 15 and August 15 through December 31. During the summer months (May 15 through August 15), it is recommended that browntop millet be utilized as the nurse crop. The use of cereal (winter) rye is highly discouraged due to the allelopathic effects it could have on the establishment of the permanent crop. It is recommended that annual rye be planted at a nurse rate of 4 pounds per acre and winter wheat at a rate of 10 pounds per acre, individually. Browntop millet should be seeded at a rate of 5 pounds per acre.

Annual ryegrass, winter wheat, and browntop millet are intended to be a temporary cover to enhance soil stability. In wetland areas, restoration activities will involve returning wetlands to pre-construction contours and seeding in non-inundated areas with an approved wetland seed mix. The seed mixes proposed for the Project are included within the Riparian Area Impact Assessment and Restoration Plan for Columbia County (**Appendix L-2**), and in the BMPs and Quantities Plan Set, included within **Attachment M** of the revised Application. PEM wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation will revert to emergent vegetation following construction, resulting in no permanent change to wetland type. Wetland areas will not be amended with fertilizer, lime, or mulch unless required by applicable federal and state agencies.

Wetlands will be monitored post-construction in accordance with the Transco Procedures (Attachment 18 of the Transco ECP [**Attachment M**]). Revegetation will be considered successful when the vegetative cover returns to at least 80 percent of the type, density, and distribution of the native vegetation in adjacent, undisturbed portions of the wetland. Within three years after construction, Transco will file a report with FERC identifying the status of the wetland revegetation efforts and documenting success as defined in the Transco Procedures.

For any wetland where revegetation is not successful at the end of three years after construction, Transco will develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate wetlands. Transco will continue revegetation efforts and file a report annually documenting progress in these wetlands until wetland revegetation is successful.

Additional avoidance and minimization measures are described in the Transco Procedures, which is included as Attachment 18 of the Transco ECP (**Attachment M**). To minimize adverse impacts at watercourse crossings, the Transco Procedures will be implemented during construction, post-construction restoration, and operation of the Project. In addition, construction activities at watercourse crossings will be performed in accordance with the USACE permit requirements, PA DEP permit requirements, and the FERC Order. The Transco Procedures also outline the plan for correction of deficiencies identified during post-construction monitoring.

Cleanup and Restoration

Upon completion of wetland crossings, Transco will promptly restore wetlands to their original configurations and contours and promptly stabilize disturbed adjacent upland areas. Final wetland elevations will be determined using civil survey (sub-centimeter accuracy) data collected prior to construction. Through these activities, Transco seeks to protect wetlands from sediment transport and restore as quickly as possible. Following construction, Transco will monitor disturbed wetlands and adjacent uplands until restoration and long-term stabilization is documented.

Upon completion of in-stream construction, Transco will restore the stream bed and banks to minimize erosion, washouts, and associated turbidity and sedimentation. Transco will

stabilize the stream bed and banks to preconstruction contours such that they are similar to banks at the limits of disturbance. Transco will also utilize pre-construction photographs. Banks will be stabilized using geotextile fabric. **Appendix L-3** Table 1 identifies each watercourse and the stream restoration detail to be utilized on either bank. A typical detail for streambed restoration is included in the BMPs and Quantities Plan Set within **Attachment M**. The streambed will be restored to grade using native streambed material. To further stabilize the surface water banks, Transco will re-vegetate the banks and riparian areas using approved seed mixes **in accordance with the Riparian Area Impact Assessment and Restoration Plan for Columbia County within Appendix L-2**. The temporary vegetation will stabilize the area until indigenous riparian species are re-established. If inclement weather limits the effectiveness of reseeding efforts, temporary erosion control measures will be implemented to minimize erosion until conditions are suitable for reseeding. The temporary erosion control measures will be monitored and maintained until conditions are suitable for completion of restoration. No fertilizers, lime, or mulch will be utilized in riparian areas unless required in writing by the PA DEP and USACE permit requirements and the FERC Order.

Following construction, disturbed areas will be reseeded with approved seed mixes in accordance with the Transco Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Transco Procedures (Transco Plan) (Attachments 17 and 18 of the Transco ECP (**Attachment M**)), **and the Riparian Area Impact Assessment and Restoration Plan for Columbia County (Appendix L-2)**. Trees and other woody vegetation will be allowed to reestablish naturally within the temporary ROWs and other temporary workspaces that were cleared for construction of the pipeline. The use of soil conservation techniques will avoid and/or minimize erosion and runoff that could potentially affect surface water quality.

Temporary alteration of the ROWs and construction areas is expected to be relatively insignificant compared to the size of drainage areas and sub-watersheds of surface water systems across the Project area. Considering the Project's BMPs for erosion and sediment control measures provided in Attachment 2 of the Transco ECP (**Attachment M**), such as the use of slope breakers, silt fence, and sediment traps, site stabilization during construction, and revegetation, changes in the type of the vegetative cover and shading of surface waters will vary by crossing. Areas with forested riparian zones may experience

temporary or permanent reduction/loss of shading and thermal effects in the vicinity of areas where tree clearing occurs. The construction ROWs will be as narrow as practicable to construct safely, and the area of increased light penetration and increased water temperatures will be limited to a relatively short length of the surface water; therefore, habitat changes within the channel will be minimal. In areas where the forested buffer can regenerate naturally (in the construction ROW outside the permanent ROW), the effect will decrease over time as trees grow and mature and shading increases.

Wetlands

There are ~~4.09424.2558~~ acres of temporary wetland impacts to PEM wetlands, 0.1920 acres of temporary impacts to PSS wetlands, ~~0.65140.4924~~ acre of temporary impacts to PFO wetlands, and ~~0.05540.1778~~ acre of temporary impacts to PUB wetlands associated with the construction of the pipeline, which will be restored upon completion of construction, allowing the wetlands to revert to the pre-construction vegetation type. The Project will result in ~~0.38410.4468~~ acre of permanent impacts to PEM wetlands, 0.0218 acre of permanent impacts to PSS wetlands, ~~0.42350.4193~~ acre of permanent impacts to PFO wetlands, and ~~0.00830.0258~~ acre of permanent impacts to PUB wetlands. There will be no fill placed in wetlands and no permanent loss of wetlands as a result of the Project. Construction workspace has been reduced to 75 feet at most wetland crossings, unless necessary due to site specific constraints. **Attachment P-1, Appendix P-1** provides a table of locations and justifications where ROWs in certain wetlands exceed the 75 foot maximum width recommended by the FERC. Permanent impacts to wetlands are associated with those wetlands located within the new permanent easement which is to be maintained during operation of the pipeline, as directed by the PA DEP. For PFO wetlands, this is considered to be a vegetative class change. Table L(d)-4 details the anticipated impacts to wetlands as a result of the Project.

Table L(d)-4
 Wetland Impacts Associated with the Atlantic Sunrise Project in Columbia County

Resource Name	Chapter 105.17 Wetland Classification	Wetland Cowardin Classification	Temporary Impact area ^a (acres)	Permanent Impact area (acres)	Latitude	Longitude
W-T01-12004	Other	PEM	0.0057	0.0009	41.03608	-76.49024
W-T02-14001	EV	PEM	0.0695	0.0143	41.2524	-76.42429
W-T02-15001A	EV	PEM	0.3953	0.0312	41.27309	-76.4032
W-T02-15003A	EV	PEM	0.0294	0.0000	41.27293	-76.39555
W-T02-15004A	EV	PEM	0.2459 0.1161	0.0553 0.0000	41.27322 41.27334	-76.38923 -76.38919
W-T02-15005	Other	PEM	0.0433	0.0030	41.27313	-76.38558
W-T02-15006A / W-T02-15006A-1	EV	PEM	0.1731	0.0093	41.27302	-76.38462
W-T02-15007	EV	PEM	0.0031	0.0008	41.27297	-76.38282
W-T02-15009A	EV	PEM	0.1919	0.0250	41.27628	-76.36335
W-T02-15010A / W-T02-15010A-1	EV	PEM	0.3599	0.0415	41.27814	-76.35227
W-T02-15012A	EV	PEM	0.3492	0.0183	41.28197	-76.32757
W-T02-15013A	EV	PEM	0.0596	0.0030	41.27941	-76.34417
W-T02-15014A / W-T02-15014A-1 / W-T02-15014A-2	EV	PEM	0.2244	0.0080	41.28075	-76.33564
W-T02-15015A	EV	PEM	0.4292	0.0204	41.28131	-76.33182
W-T02-15016A /W- T02-15016A-1	EV	PEM	0.3033	0.0250	41.28328	-76.31904
W-T04-12002A	Other	PEM	0.3773 0.3721	0.0251 0.0303	40.97551	-76.49735
W-T06-13002	EV	PEM	0.0421	0.0156	41.07648	-76.46854
W-T06-13003A	EV	PEM	0.0227	0.0031	41.07991	-76.46831
W-T06-13005	EV	PEM	0.0822	0.0104	41.08488	-76.46801
W-T06-14001	EV	PEM	0.0196	0.0048	41.26733	-76.41009
W-T10-14001A	EV	PEM	0.0207	0.0077	41.18132	-76.43639
W-T15-14003	EV	PEM	0.0075	0.0068	41.20803	-76.43026
W-T15-14004	EV	PEM	0.0276	0.0044	41.22367	-76.42675
W-T16-14001A	EV	PEM	0.1113	0.0101	41.14475	-76.43632
W-T21-13001	EV	PEM	0.0044	0.0000	41.11985	-76.45111
W-T35-13001	EV	PEM	0.1497 0.1495	0.0224	41.0986	-76.46068
W-T35-13002	EV	PEM	0.0715	0.0023	41.09474	-76.46456
W-T44-14001A	EV	PEM	0.0222	0.0000	41.14544	-76.43575
W-T49-11002	EV	PEM	0.0841	0.0143	40.84012	-76.50646
W-T63-14001	Other	PEM	0.1131	0.0190	41.09401	-76.46494
W-T70-12005A	Other	PEM	0.0937	0.0128	41.00337	-76.49354

Table L(d)-4
 Wetland Impacts Associated with the Atlantic Sunrise Project in Columbia County

Resource Name	Chapter 105.17 Wetland Classification	Wetland Cowardin Classification	Temporary Impact area ^a (acres)	Permanent Impact area (acres)	Latitude	Longitude
W-T70-12007	Other	PEM	0.0194	0.0033	41.02296	-76.47901
W-T70-12008	Other	PEM	0.0111	0.0007	41.01926	-76.47746
W-T70-12009	Other	PEM	0.0060	0.0008	41.00477	-76.48944
W-T70-12010A-1 / W-T70-12010A-2	Other	PEM	0.0535	0.0192	41.01559	-76.47637
W-T90-14005A / W-T90-14005A-1	EV	PEM	0.0017	0.0006	41.12087	-76.44933
W-T74-12001A-1	Other	PEM	0.0026	0.0001	40.96518	-76.49136
W-T61-13001A	Other	PEM	0.0342	0.0021	41.04254	-76.48574
Total PEM Wetland Impacts			4.2558 4.0942	0.4468		
W-T04-12004 / W-T04-12004-1	Other	PSS	0.0562	0.0060	40.97704	-76.49856
W-T06-13003B	EV	PSS	0.0058	0.0000	41.07985	-76.46839
W-T10-14001B	EV	PSS	0.0566	0.0043	41.18100	-76.43630
W-T21-13002	EV	PSS	0.0292	0.0029	41.11914	-76.45155
W-T70-12005B	Other	PSS	0.0442	0.0086	41.00348	-76.49345
Total PSS Wetland Impacts			0.1920	0.0218		
W-T02-15001C	EV	PFO	0.0294	0.0091	41.27309	-76.4027
W-T02-15003C	EV	PFO	0.0043	0.0015	41.27306	-76.39562
W-T02-15004C	EV	PFO	0.2280	0.0520	41.27347	-76.38913
W-T02-15009C	EV	PFO	0.0286	0.0033	41.27609	-76.36372
W-T02-15010C / W-T02-15010C-1 / W-T02-15010C-2	EV	PFO	0.0686	0.0119	41.27802	-76.35236
W-T02-15012C / W-T02-15012C-2	EV	PFO	0.0284	0.0034	41.28174	-76.32875
W-T02-15014C-2	EV	PFO	0.0232	0.0167	41.28065	-76.3358
W-T02-15015C	EV	PFO	0.0458	0.0011	41.28118	-76.33222
W-T02-15016C	EV	PFO	0.0012	0.0000	41.28332	-76.31915
W-T04-12001C	Other	PFO	0.0660 0.0114	0.0456	40.95268	-76.48555 -76.4855
W-T04-12002C	Other	PFO	0.1652 0.1789	0.2560 0.2423	40.97514	-76.49704
W-T06-13003C	EV	PFO	0.0173	0.0229	41.07995	-76.46819
W-T74-12001C	Other	PFO	0.0007	0.0615	40.96524	-76.49143
Total PFO Wetland Impacts			0.4924 0.6514	0.4193 0.4235		
WB-T35-11001	Other	PUB	0.0554	0.0083	40.89822	-76.48732
WB-T89-001	CWF, MF	PUB	0.1224	0.0175	40.98166	-76.49934

**Table L(d)-4
 Wetland Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource Name	Chapter 105.17 Wetland Classification	Wetland Cowardin Classification	Temporary Impact area ^a (acres)	Permanent Impact area (acres)	Latitude	Longitude
Total PUB Wetland Impacts			0.0554 0.1778	0.0083 0.0258		
Source: http://www.pacode.com/secure/data/025/chapter105/s105.17.html https://www.fws.gov/wetlands/Data/Wetland-Codes.html Key: PEM = Palustrine Emergent PSS = Palustrine Shrub-Shrub PFO = Palustrine Forested PUB = Palustrine Unconsolidated Bottom EV = Exceptional Value a: <i>Temporary impacts to PFO wetlands include temporal conversion from forested to scrub-shrub or emergent wetland. Within this wetland, a 30-foot-wide corridor centered over the pipeline will be permanently converted from forested to scrub-shrub or emergent wetland; the remainder of the wetland will be allowed to fully revert back to PFO.</i>						

Transco will use the conventional open-cut pipeline crossing method in wetlands where soils are unsaturated and able to support construction equipment at the time of crossing. This method requires segregation of topsoil from subsoil along the trench line. Where present, the Transco Procedures (ECP Attachment 18, provided within **Attachment M** of this Application) and Agricultural and Construction Monitoring Plan (ECP Attachment 6, provided within **Attachment M** of this Application) indicate that the top 12 inches of topsoil from wetland and agricultural areas disturbed by trenching will be segregated from subsoil, except in areas where standing water is present, soils are saturated, or where shallow depth to bedrock conditions exist. These exceptions will be identified via visual assessment during grading and documented in the field with the Environmental and/or Agricultural Inspector. Once this is done Transco will conduct trench excavation, pipe laying, backfilling, and grade restoration. Immediately after backfilling is complete, Transco will replace the segregated topsoil to its original horizon location and install applicable erosion control measures. Transco will use the conventional open-cut wetland construction method for crossing wetlands with saturated soils or soils unable to support construction equipment without considerable soil disturbance. Prior to crossing and movement of construction equipment through these wetlands, Transco will stabilize the ROW using equipment mats to allow for a stable, safe working condition and to prevent significant rutting/soil disturbance. Transco will temporarily store trench spoil in a ridge along the

pipeline trench, leaving gaps as appropriate intervals to provide for natural circulation or drainage of water. Topsoil will not be segregated where standing water is present or soils are saturated.

While excavating the trench, Transco will attempt to assemble the pipeline in a staging area located in an upland area unless the wetland is dry enough to support skids and pipe. Transco will then move the pipe to the ROW. Pipe stringing and fabrication may occur within the wetland adjacent to the trench or adjacent to the wetland in an approved ATWS. After lowering the pipeline into the trench, Transco will work from equipment mats to perform backfilling, final cleanup, and grading.

Construction in inundated wetland areas may require the push-pull technique. The push-pull technique can be used in large inundated wetland areas (>300 feet crossing length) where sufficient water is present to float the pipeline in the trench and where grade elevation over the length of the push-pull area will not require damming to maintain adequate water levels for flotation of the pipe. Transco will use this technique when inundated conditions prevent the use of conventional open-cut wetland construction techniques.

Operation of construction equipment through wetlands will be limited to only that necessary for each stage of pipeline installation (e.g., clearing, trenching). Topsoil segregation techniques will be used in wetlands that are not saturated or inundated to preserve the seed bank and to facilitate successful restoration. Wetland crossing methods will be determined based on site-specific conditions at the time of crossing. Wetlands with soils that can support construction equipment may be crossed using the conventional open-cut method, as described below, with the use of timber mats to prevent soil rutting. In forested wetlands, Transco will minimize tree clearing to the extent practicable while maintaining safe construction conditions. Typical drawings for the wetland crossings are provided in Attachment 2 of the Transco ECP (**Attachment M**).

Some wetland vegetation will be cut, removed, or crushed during construction. After the completion of construction, wetland areas within the ROW will be restored to preconstruction contours and revegetated with annual ryegrass where standing water is not present to stabilize disturbed soils. Annual ryegrass is intended to be a temporary

cover to enhance soil stability. In wetland areas, restoration activities will involve returning wetlands to pre-construction contours and seeding in non-inundated areas with an approved wetland seed mix. PEM wetlands, dominated primarily by low-growing sedges, rushes, and other herbaceous vegetation will revert to emergent vegetation following construction, resulting in no permanent change to wetland type. Wetland areas will not be amended with fertilizer, lime, or mulch unless required by appropriate federal and state agencies.

Upon completion of wetland crossings, Transco will restore wetlands to their original configurations and contours and stabilize disturbed adjacent upland areas. Through these activities, Transco seeks to protect wetlands from sediment transport and restore native hydrophytic vegetation as quickly as possible. Following construction, Transco will monitor disturbed wetlands and adjacent uplands until restoration and long-term stabilization is documented per the requirements of the FERC Order and other applicable regulatory approvals.

Revegetation will be considered successful when the vegetative cover returns to at least 80 percent of the type, density, and distribution of the native vegetation in adjacent, portions of the wetland not disturbed by construction of the Project.

Additional wetland avoidance and minimization measures are described in the Transco Procedures, which is included as Attachment 18 of the Transco ECP (**Attachment M**) as well as the Alternatives Analysis for this application (**Attachment P-1**).

Compensatory Mitigation for Wetland Impacts

No permanent fill will be placed in wetlands as a result of this Project. Mitigation will be required for permanent conversion of vegetation cover type for PFO and PSS wetlands and for temporary conversion of vegetation cover type for PFO wetlands. The following impact mitigation ratios were determined in coordination with the PA DEP and USACE: 2.5:1 for EV PFO wetlands, 2:1 for non-EV PFO wetlands, 1.75:1 for EV PSS wetlands, and 1.5:1 for non-EV PSS wetlands.

The Project will result in 0.94 acres of impacts to EV and non-EV PSS and PFO wetlands in Columbia County (excluding temporary impacts to PSS wetlands). Mitigation will be required for the 0.94 acre of wetland impacts within Columbia County. ~~The Project will result in 0.60 acre of impacts to EV PFO wetlands, 0.48 acre of impacts to non-EV PFO wetlands, 0.01 acre of permanent impacts to EV PSS wetlands, and 0.01 acre of permanent impacts to non-EV PSS wetlands in Columbia County. Mitigation will be required for 1.10 acre of wetland impacts within Columbia County~~ which will be mitigated for at the Swatara Creek Permittee-Responsible Mitigation (PRM) site in Schuylkill County as detailed in **Attachments Q-1 and Q-2**. Transco proposes to provide off-site mitigation for [(~~0.48~~**0.60** acres*2 ratio = ~~0.96~~**1.20** acres) + (~~0.60~~**0.32** acres*2.5 ratio = ~~1.50~~**0.80** acres) + (0.01 acre *1.5 = 0.02 acre) + (0.01 acre*1.75 = 0.02) = **2.502.03** acres]. The mitigation site will provide sufficient acreage to compensate for the above-listed impacts, with additional ecological benefits beyond the required mitigation. Some of the temporary and permanent PFO impact areas are also being replanted on-site, providing double mitigation for these areas.

~~The mitigation site is oversized to account for potential Project-related wetland impacts within parcels that currently do not have access for surveys. For mitigation planning purposes remote sensed features on the remaining no-survey parcels are included on the impact table in Attachment E-3 and are depicted on the impact mapping in Attachment H-2. Remote sensed features are identified with an RS prefix (e.g., WW-RS-1009) within the impact tables and mapping.~~

Transco has provided a Mitigation Master Plan and a Site Specific Mitigation Plan for the Swatara Creek PRM site in Schuylkill County. Under the authorization of this Chapter 105 permit application, Transco is seeking authorization to construct the Mitigation Site for this Project. The PRM Plan is provided as **Attachment Q-2**. Impacts to regulated resources at the Swatara Creek PRM site are included in the revised Application for Schuylkill County.

Swatara Creek PRM Site

The Swatara Creek PRM Site will now provide mitigation for PFO/PSS impacts in Columbia County. As described in the Swatara Creek PRM Site Plan, the majority of the wetlands identified within the PRM Site have been degraded to varying degrees through

anthropogenic alterations including agricultural activities and the introduction of non-native pasture grasses. The PRM Site is currently in varying stages of ecological degradation and recovery as a result of historical anthropogenic influences, many of which are consistent with historic land use trends across central PA. The biological integrity of the PRM Site has been ecologically and physically altered through the installation of drainage ditches, manipulation of the existing stream channel dimensions and characteristics, and through general land use for agricultural purposes. Wetlands within the PRM Site are routinely mowed, are dominated by invasive species including reed canary grass, and provide little function and value to the surrounding landscape.

The Wetland Function-Value Evaluation Form in the Supplement was completed at the Swatara Creek PRM Site in order to capture the existing, or pre-restoration conditions at the PRM Site as well as the anticipated ecological lift the site will experience as a result of the restoration activities. The wetland functions and values assessments performed at the Project impact locations and the PRM Site indicate that the mitigation site, once restored, will compensate and replace the functions and values impacted as a result of the Project by providing improved wildlife habitat, flood flow alteration, and nutrient removal/retention (the top three functions and values lost as a result of Project construction) at comparatively high levels.

By following the USACE Highway Supplement for identifying wetland functions and values, and completing pre- and post-Wetland Function-Value Evaluation Forms for the Swatara Creek PRM Site, it was determined that the wetland identified within the PRM Site is currently suitable for two functions and values (**Appendix F: Wetland Function and Values Assessment Forms of the PRM Plan**). However, given the current degraded state of the wetland and its immediate surroundings, only one of the functions and values (flood flow alteration) is considered a principal function.

Post restoration, it is anticipated that the wetlands within Swatara Creek PRM Site will be suitable for eight functions and values, of which six of those will be performing at principal levels (flood flow alternation, sediment/toxicant retention, nutrient removal, wildlife habitat, uniqueness/heritage, and endangered species habitat). A vast majority of the wetlands will experience an increase in the level of suitability and principality for the given functions and values.

Removing invasive and non-native vegetation and re-planting the Swatara Creek PRM Site with a native-community will increase the vegetative diversity and density of the PRM Site. This restoration activity proposed for the PRM Site will most notably enhance the quality and quantity of wildlife habitat available within the PRM Site. Increasing wetland acreage within the PRM Site through re-establishment methods, coupled with vegetative enhancement, will improve the effectiveness of the wetland in reducing flood damage by increasing water retentions for prolonged periods following precipitations events and the gradual release of floodwaters. Increased vegetative diversity, including plant community structure, and density will be able to retain higher volumes of water than under normal or average rainfall conditions, supporting additional stability of the wetland ecological system and its buffering characteristics, and thereby providing social and economic value related to erosion and flood prone areas. Sources of excess sediment exist surrounding the wetland, and with the proposed restoration activities, this wetland will be better capable of reduces or preventing degradation of water quality as it will act as a trap for sediments, toxicants and/or pathogens in runoff in runoff water. Post-restoration, wetlands at the PRM Site will become significantly more effective for nutrient removal/retention/transformation as they will be better able to trap nutrients in runoff water and process then into other forms or trophic levels. The enhancement and establishment of improved vegetative density and diversity will be enable the wetland to utilize the nutrients. Enhancement of the wetland and riparian habitats surrounding the waters within the PRM Site will improve the effectiveness as a streambank stabilizer, complete with large trees and shrubs that post-restoration, will be more effectively able to withstand larger flood events or erosive incidents. Post restoration, the wetland will exhibit a higher degree of plant community structure, density and diversity, and will offer greater usable products for living organism, thereby improving production export functionality. Habitat for known species of special concern will be improved, an invaluable functional uplift.

Refer to the Swatara Creek PRM Site Plan for additional details including the functions and values forms provided as **Appendix F: Wetland Function and Values Assessment Forms**.

Watercourses and Bodies of Water

Seventy-one watercourses will be crossed during construction of the pipeline in Columbia County. The centerline of the pipeline will cross each watercourse utilizing the construction

method indicated in the table below. Temporary construction bridges will be used to cross the streams with equipment, as necessary, during construction. Temporary stream impacts total ~~3.189~~**211.1051** acres of perennial streams, and approximately ~~0.672~~**40.7031** acre of intermittent and ephemeral streams. Permanent stream impacts are defined by the placement of the pipeline and permanent operation easement as directed by PA DEP, and total ~~0.472~~**80.4798** acre of perennial streams and ~~0.083~~**90.0906** acre of intermittent and ephemeral streams. Transco is proposing to cross watercourses using a dam-and-pump, **flume, coffer dam, conventional bore**, or HDD construction method (see also **Attachment P-1, Appendix P-1**).

No fill or water obstructions will be added to streams as a part of this Project, therefore no loss of stream functions and values is expected to occur. Impacts are detailed in Table L(d)-5.

**Table L(d)-5
 Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)		Temporary Impact area (Acres)	Permanent Impact Dimensions (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Feet) ^b		(Feet) ^b	(Feet) ^b				
WW-T02-15002	UNT to Fishing Creek	CWF, MF	Perennial	Wild Trout Waters	94.70	5.55	0.0205	5.57	5.55	0.0006	41.27303	-76.39555	Dam-and-Pump
WW-T02-15006	UNT to Fishing Creek	CWF, MF	Perennial	Wild Trout Waters	86.77	20.51	0.0358	5.04	20.51	0.0023	41.27303	-76.38469	Dam-and-Pump
WW-T02-15007	Fishing Creek	CWF, MF	Perennial	Approved Trout Waters; Wild Trout Waters	105.93	119.84	0.2352	5.98	119.84	0.0137	41.27291	-76.38197	Dam-and-Pump
WW-T02-15008	UNT to East Branch Fishing Creek UNT to Fishing Creek	HQ-CWF, MF CWF, MF	Perennial	Wild Trout Waters	70.96 76.03	20.67 46.72	0.0307 0.0763	10.14 5.07	20.67 46.72	0.0047 0.0054	41.27497	-76.36929 -76.36928	Dam-and-Pump
WW-T02-15010	Hess Hollow	HQ-CWF	Perennial	Class A Wild Trout Waters	82.01	5.87	0.0146	5.29	5.87	0.0007	41.27799	-76.35279	Dam-and-Pump
WW-T02-15011	UNT to Hess Hollow	HQ-CWF	Perennial	Class A Wild Trout Waters; Wild Trout Waters	92.35	12.56	0.0291	5.01	12.56	0.0015	41.27812	-76.35193	Dam-and-Pump
WW-T02-15012	Coles Creek	HQ-CWF, MF	Perennial	Wild Trout Waters	108.51	31.10	0.0552	11.84	31.10	0.0048	41.28169	-76.32906	Dam-and-Pump
WW-T02-15012C	UNT to Coles Creek	HQ-CWF, MF	Perennial	Wild Trout Waters	82.82	27.09	0.0347	5.40	27.09	0.0030	41.28169	-76.32927	Dam-and-Pump
WW-T02-15013	UNT to Coles Creek	CWF, MF	Perennial	Wild Trout Waters	90.12	32.98	0.0597	5.20	32.98	0.003	41.27947	-76.34376	Dam-and-Pump
WW-T02-15014	Ashelman Run	CWF, MF	Perennial	Wild Trout Waters	87.30	11.30	0.0263	5.02	11.30	0.0012	41.28075	-76.33496	Dam-and-Pump
WW-T04-11001	Mugser Run	HQ-CWF, MF	Perennial	Approved Trout Waters; Trout Stocked Stream; Wild Trout Waters	84.96	28.07	0.0455	10.69	28.07	0.0065	40.87835	-76.48641	Dam-and-Pump
WW-T04-11002	UNT to Roaring Creek	TSF, MF	Perennial	Wild Trout Waters	85.98	11.80	0.0225	12.12	11.80	0.0027	40.88601	-76.48611	Conventional Bore Dam-and-Pump
WW-T04-12001	Susquehanna River	WWF	Perennial	WWCW Fisheries Streams	426.89 43.78	1003.29	8.8319 ^c 0.9213	10.95	1003.29	0.2303	40.95034 40.95028	-76.48490 -76.48468	Cofferdam ^c HDD

**Table L(d)-5
 Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)		Temporary Impact area (Acres)	Permanent Impact Dimensions (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Feet) ^b		(Feet) ^b	(Feet) ^b				
WW-T04-12005	Montour Run	CWF, MF	Perennial	None	148.71	12.33	0.0700	11.67	12.33	0.0030	40.97699	-76.49838	Dam-and-Pump
WW-T04-12006	UNT to Montour Run	CWF, MF	Perennial	None	139.12	45.01	0.0431	22.18	45.01	0.0057	40.98219	-76.49921	Dam-and-Pump
WW-T06-13002	UNT to Deerlick Run	CWF, MF	Perennial	Wild Trout Waters (Under Review)	123.40	12.46	0.0299	11.73	12.46	0.0029	41.07998	-76.46833	Dam-and-Pump
WW-T06-14001	UNT to West Creek	CWF, MF	Perennial	Approved Trout Waters; Wild Trout Waters	89.31	18.60	0.0403	10.50	18.60	0.0043	41.26719	-76.41055	Dam-and-Pump
WW-T06-14002	West Creek	CWF, MF	Perennial	Approved Trout Waters; Wild Trout Waters	83.03	40.38	0.0699	10.03	40.38	0.0093	41.26642	-76.41164	Dam-and-Pump
WW-T15-14003	UNT to Green Creek	TSF, MF	Perennial	Wild Trout Waters	94.25	13.62	0.0269	10.23	13.62	0.0032	41.19815	-76.43368	Dam-and-Pump
WW-T15-14007	Green Creek	TSF, MF	Perennial	Wild Trout Waters	98.45	13.93	0.0377	10.06	13.93	0.0033	41.20818	-76.42977	Dam-and-Pump
WW-T15-14007A	UNT to Green Creek	TSF, MF	Perennial	Wild Trout Waters	33.27	13.74	0.0083	0.00	0.00	0.0000	41.20823	-76.42973	N/A
WW-T16-14002	UNT to Green Creek	TSF, MF	Perennial	Wild Trout Waters	69.99	19.49	0.0228	11.78	19.49	0.0045	41.18094	-76.43643	Dam-and-Pump
WW-T16-14003	Little Green Creek	TSF, MF	Perennial	Wild Trout Waters	81.09	31.56	0.0610	10.15	31.56	0.0073	41.14463	-76.43665	Dam-and-Pump
						76.95	0.1369		76.95	0.0177	41.14459		
WW-T17-14001	UNT to York Hollow	CWF, MF	Perennial	Wild Trout Waters	114.32	14.99	0.0266	10.60	14.99	0.0035	41.24264	-76.42670	Dam-and-Pump
WW-T21-13001	Mud Run	TSF, MF	Perennial	Wild Trout Waters	83.58	27.92	0.0557	10.66	27.92	0.0064	41.11986	-76.45089	Dam-and-Pump
WW-T21-13001A	UNT to Mud Run	TSF, MF	Perennial	Wild Trout Waters	80.37	23.30	0.0445	10.08	23.30	0.0053	41.12094	-76.44940	Dam-and-Pump
WW-T35-11001	Roaring Creek	TSF, MF	Perennial	Approved Trout Waters, Trout Stocked Stream, Wild Trout Waters	96.30	60.50	0.1072	11.11	60.50	0.0137	40.89862	-76.48735	Dam-and-Pump
WW-T35-13001	UNT to Deerlick Run	CWF, MF	Perennial	Wild Trout Waters (Under Review)	85.86	69.67	0.0913	13.97	69.67	0.0155	41.09849	-76.46082	Dam-and-Pump

**Table L(d)-5
 Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)		Temporary Impact area (Acres)	Permanent Impact Dimensions (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Feet) ^b		(Feet) ^b	(Feet) ^b				
WW-T35-13002	Deerlick Run	CWF, MF	Perennial	Wild Trout Waters (Under Review)	67.07	13.80	0.0231	10.01	13.80	0.0032	41.09462	-76.46469	Dam-and-Pump
WW-T44-11001	South Branch Roaring Creek	HQ-CWF, MF	Perennial	Class A Wild Trout Waters	90.09	65.13	0.1294	10.01	65.13	0.0150	40.85479	-76.49852	Dam-and-Pump
WW-T45-11001	South Branch Roaring Creek	HQ-CWF, MF	Perennial	Class A Wild Trout Waters	80.44	55.71	0.0946	10.05	55.71	0.0127	40.83992	-76.50717	Flume
WW-T47-11001	UNT to South Branch Roaring Creek	HQ-CWF, MF	Perennial	Class A Wild Trout Waters	90.49	29.75	0.0614	10.03	29.75	0.0068	40.84917	-76.50304	Dam-and-Pump
WW-T52-1300	UNT to Little Fishing Creek	CWF, MF	Perennial	None	66.75	38.04	0.0184	26.08	38.04	0.0071	41.04721	-76.48758	Dam-and-Pump
WW-T67-13001	UNT to Green Creek	TSE, MF	Perennial	Wild Trout Waters	50.02	9.88	0.0094	0.00	0.00	0.0000	41.21247	-76.42416	N/A
WW-T70-12003	Hemlock Creek	CWF, MF	Perennial	Wild Trout Waters	83.31	43.28	0.0788	10.55	43.28	0.0099	41.00323	-76.49387	Dam-and-Pump
WW-T70-12003A	UNT to Hemlock Creek	CWF, MF	Perennial	Wild Trout Waters	1.62	2.79	0.0003	0.00	0.00	0.0000	41.00341	-76.49416	N/A
WW-T70-12006	Fishing Creek	WWF, MF	Perennial	WWCW Fisheries Streams	76.83	24.96	0.0258	0.00	0.00	0.0000	41.01647	-76.47557	Water Withdrawal
WW-T70-12010	Little Fishing Creek	CWF, MF	Perennial	WWCW Fisheries Streams	96.68	79.85	0.1583	10.68	79.85	0.0183	41.02292	-76.47919	Dam-and-Pump
WW-T70-12010-1	Little Fishing Creek	CWF, MF	Perennial	WWCW Fisheries Streams	51.37	79.09	0.0703	13.85	79.09	0.0182	41.01918	-76.47750	Open Cut HDD
WW-T70-12011	UNT to Fishing Creek	CWF, MF	Perennial	None	97.72 154.23	22.98 23.60	0.0496 0.0799	10.46 10.91	22.98 23.60	0.0053	41.01534 41.01519	-76.47647	Dam-and-Pump
WW-T91-15001	UNT to West Creek	CWF, MF	Perennial	Wild Trout Waters	27.46	10.73	0.0034	0.00	0.00	0.0000	41.27300	-76.40286	N/A
WW-T92-15001	UNT to Hess Hollow	HQ-CWF	Perennial	Class A Wild Trout Waters; Wild Trout Waters	90.84	5.16	0.0101	5.18	5.16	0.0006	41.27804	-76.35271	Dam-and-Pump
WW-T92-15001B	UNT to Fishing Creek	CWF, MF	Perennial	Wild Trout Waters	75.13	10.45	0.0382	5.33	10.45	0.0012	41.27292	-76.38284	Dam-and-Pump
WW-T81-13001	Little Fishing Creek	CWF, MF	Perennial	None	92.02	62.36	0.1272	10.05	62.36	0.0143	41.04131	-76.48522	Dam-and-pump
WW-T88-004	Susquehanna River	WWF, MF	Perennial	WWCW Fisheries Stream	95.01	21.07	0.0250	0.00	0.00	0.0000	40.95352	-76.46625	Water Withdrawal

**Table L(d)-5
 Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)		Temporary Impact area (Acres)	Permanent Impact Dimensions (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Feet) ^b		(Feet) ^b	(Feet) ^b				
WW-T89-001	UNT to Montour Run	CWF, MF	Perennial	None	49.69	17.47	0.0084	21.10	17.47	0.0038	40.98194	-76.49921	Dam-and-pump
Perennial Stream Impacts							11.1051 3.1892			0.4798 0.4728			
WW-T01-12005	UNT to Little Fishing Creek	CWF, MF	Intermittent	None	81.59	5.27	0.0093	10.58	5.27	0.0012	41.03610	-76.49025	Dam-and-Pump
WW-T01-13002	UNT to Little Fishing Creek	CWF, MF	Intermittent	None	101.88	39.78	0.0759	13.75	39.78	0.0092	41.06160	-76.47782	Dam-and-Pump
WW-T01-13003	UNT to Little Fishing Creek	CWF, MF	Intermittent	None	97.81	11.19	0.0290	11.58	11.19	0.0027	41.06261	-76.47819	Dam-and-Pump
WW-T01-13004	UNT to Little Fishing Creek	CWF, MF	Intermittent	None	132.40	65.59	0.1062	69.29	65.59	0.0149	41.06753	-76.47391	Dam-and-Pump
WW-T02-15004	UNT to Fishing Creek	CWF, MF	Intermittent	Wild Trout Waters	103.27 16.44	18.19 4.42	0.0162 0.0231	32.70 161.88	18.19 4.42	0.0035 0.0025	41.27317 41.27342	-76.38875 -76.38915	Dam-and-pump Flume
WW-T02-15009	UNT to Coles Creek UNT to Fishing Creek	CWF, MF	Intermittent	Wild Trout Waters	79.36	8.21	0.0125	7.04	8.21	0.0009	41.27615	-76.36351	Dam-and-Pump
WW-T04-11001A	UNT to Mugser Run	HQ-CWF, MF	Intermittent	Approved Trout Waters; Trout Stocked Stream; Wild Trout Waters	33.54	13.94	0.0070	11.24	13.94	0.0030	40.87840	-76.48630	Dam-and-Pump
WW-T04-12002	UNT to Montour Run	CWF, MF	Intermittent	None	91.37	28.58	0.0290	10.7	28.58	0.0066	40.97652	-76.49814	Dam-and-Pump
WW-T04-12003	UNT to Montour Run	CWF, MF	Intermittent	None	2.55	14.08	0.0065	0.00	0.00	0.0000	40.97662	-76.49811	N/A
WW-T04-12004	UNT to Montour Run	CWF, MF	Intermittent	None	32.21	12.69	0.0044	0.00	0.00	0.0000	40.97666	-76.49816	N/A
WW-T04-12005A	UNT to Montour Run	CWF, MF	Intermittent	None	84.77	17.67	0.0414	11.10	17.67	0.0044	40.97743	-76.49869	Dam-and-Pump
WW-T06-13001	UNT to Deerlick Run	CWF, MF	Intermittent	Wild Trout Waters (Under Review)	106.64	11.12	0.0148	17.87	11.12	0.0026	41.07602	-76.46863	Dam-and-Pump
WW-T15-14005	UNT to Green Creek	TSF, MF	Intermittent	Wild Trout Waters	84.03	6.88	0.0245	10.47	6.88	0.0017	41.20657	-76.43254	Dam-and-Pump
WW-T15-14006	UNT to Green Creek	TSF, MF	Intermittent	Wild Trout Waters	84.87	15.47	0.0293	10.62	15.47	0.0036	41.20650	-76.43252	Dam-and-Pump

**Table L(d)-5
 Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)		Temporary Impact area (Acres)	Permanent Impact Dimensions (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Feet) ^b		(Feet) ^b	(Feet) ^b				
WW-T15-14008	UNT to Green Creek	TSF, MF	Intermittent	Wild Trout Waters	81.54	9.83	0.0120	12.49	9.83	0.0022	41.22369	-76.42678	Dam-and-Pump
WW-T16-14001	UNT to Green Creek	TSF, MF	Ephemeral	Wild Trout Waters	83.11	28.93	0.0094	0.00	0.00	0.0000	41.15234	-76.43391	N/A
WW-T17-14002	UNT to York Hollow	CWF, MF	Intermittent	Wild Trout Waters	81.55	8.87	0.0166	10.22	8.87	0.0020	41.24974	-76.42543	Dam-and-Pump
WW-T17-14003	York Hollow	CWF, MF	Ephemeral	Wild Trout Waters	99.30	8.85	0.0178	15.2	8.85	0.0020	41.25045	-76.42414	Dam-and-Pump
WW-T28-12004	UNT to Roaring Creek	TSF, MF	Intermittent	Approved Trout Waters, Trout Stocked Stream, Wild Trout Waters	80.60	16.74	0.0333	10.08	16.74	0.0039	40.89266	-76.48730	Dam-and-Pump
WW-T28-12005	UNT to Roaring Creek	TSF, MF	Intermittent	Wild Trout Waters	81.14	11.72	0.0251	10.33	11.72	0.0027	40.89054	-76.48736	Dam-and-Pump
WW-T31-11001	UNT to Mugser Run	HQ-CWF, MF	Intermittent	Approved Trout Waters, Trout Stocked Stream, Wild Trout Waters	94.48	21.32	0.0350	10.60	21.32	0.0051	40.87439	-76.48443	Dam-and-Pump
WW-T51-11001	UNT to South Branch Roaring Creek	HQ-CWF, MF	Intermittent	Class A Wild Trout Waters	83.56	5.16	0.0096	10.32	5.16	0.0012	40.84003	-76.50668	Dam-and-Pump
WW-T52-13001C	UNT to Little Fishing Creek	CWF, MF	Intermittent	None	29.38	13.29	0.0042	19.11	4.72	0.0011	41.04716	-76.48761	Dam-and-Pump
WW-T70-12012	UNT to Little Fishing Creek	CWF, MF	Ephemeral	None	4.96	2.26	0.0524	2.43	2.26	0.00510	1.024134	76.48294-	Dam-and-Pump
WW-T90-14003	UNT to Mud Run	TSF, MF	Intermittent	Wild Trout Waters	77.66	12.32	0.0146	12.67	12.32	0.0028	41.11917	-76.45154	Dam-and-Pump
WW-T91-15004	UNT to Coles Creek UNT to Fishing Creek	CWF, MF	Intermittent	Wild Trout Waters	97.31	11.09	0.0219	11.91	11.09	0.0025	41.27558	-76.36431	Dam-and-Pump
WW-T92-15002	UNT to Coles Creek	HQ-CWF, MF	Intermittent	Wild Trout Waters	61.38	10.76	0.0073	0.00	0.00	0.0000	41.28192	-76.32739	N/A
WW-T93-15001	UNT to Marsh Run	CWF, MF	Intermittent	Wild Trout Waters	0.27	2.77	0.0003	0.00	0.00	0.0000	41.28365	-76.31644	N/A
WW-T04-12007	UNT to Montour Run	CWF, MF	Intermittent	None	100.88	23.79	0.0333	15.64	23.79	0.0057	40.98807	-76.49796	Dam-and-pump
Ephemeral and Intermittent Stream Impacts							0.7031 0.6724			0.0906 0.0839			

Source:

<http://www.pacode.com/secure/data/025/chapter93/chap93toc.html>

http://www.fishandboat.com/waters_trout.htm

Table L(d)-5
Stream Impacts Associated with the Atlantic Sunrise Project in Columbia County

Resource ID	Resource Name	Chapter 93 Classification ^a	Stream Type	Stream PFBC Trout Status	Temporary Impact Dimensions (Length x Width)	Temporary Impact area	Permanent Impact Dimensions (Length x Width)	Permanent Impact area	Latitude	Longitude	Watercourse Crossing Method
					(Feet) ^b	(Acres)	(Feet) ^b	(Acres)			
<p>a: CWF = Cold Water Fishery; MF = Migratory Fishes; WWF = Warm Water Fishery, TSF – Trout Stocked, HQ = High Quality..</p> <p>b: Widths are reported as the maximum width for the feature. Stream lengths are reported on the impact maps as the sum of the permanent and temporary lengths.</p> <p>c: This feature will be crossed using an HDD within the LOD shown on the drawing. However, the impacts shown are for the contingency, or secondary, crossing method, since those impacts are larger. The drawing showing the LOD and resource impacts for the contingency crossing method is provided in Attachment H-3.</p>											

Dam-and-Pump Crossing Method

The dam-and-pump method for crossing surface waters temporarily diverts flow around the construction workspace while maintaining downstream flow. Transco will install dams upstream and downstream of the proposed trench and then use pumps and hoses to convey flow around the in-stream workspace to create a dry work area. The pumped water will be discharged downstream of the construction workspace. Pumps will be sized to accommodate flow based on the size of the tributary watershed. Spare pumps will be on-site for use in case the in-use pump mechanically fails during construction. Once the dam-and-pump equipment is in place and active, Transco will excavate the trench and install the pipeline in the dry ditch.

Flume Crossing

When using a flume crossing, Transco will install flume pipe(s) over the crossing location prior to trenching. Transco will maintain these pipes until restoration of the watercourse is complete. Transco will use flumes of a size and quantity sufficient to maintain the maximum anticipated downstream flows per the applicable regulations. Transco will then thread the natural gas pipe under the flume pipe(s), and backfill the ditch while flows are maintained through the flume pipe(s) and downstream.

Horizontal Directional Drill Crossing Method (HDD)

The HDD crossing method is proposed to be used to cross the Susquehanna River (WW-T04-12001) and Little Fishing Creek (WW-T70-12010-1) on CPL South in Columbia County.

The HDD method allows for trenchless construction across an area by drilling a hole significantly below conventional pipeline depth, and pulling the pipe through the predrilled hole. HDD is typically used to install pipeline in areas where traditional open-cut excavations are not feasible due to sensitive resource areas or logistical reasons. While overall disturbance within a sensitive area may be minimized by HDD, a greater amount of equipment staging is typically required. The amount of workspace at the drill entry and exit locations can vary significantly based on site-specific conditions. The entry side of the drill usually consists of the drilling rig and entry hole, control cab, drill string pipe storage, site office and storage trailers, power generators, bentonite storage, bentonite slurry mixing equipment, slurry pump, cuttings separation equipment, cutting return/settlement pit, water trucks and water storage, and the heavy construction equipment necessary to support the operation.

The exit side consists of the exit hole and slurry containment pit, cuttings return/settlement pit, cuttings separation and slurry reclamation equipment, drill string pipe storage, and heavy construction equipment necessary to support the operation. In addition to the drilling operations to be conducted within the exit side workspace, ATWS is often needed adjacent to the construction ROW to provide a straight corridor for handling pipe at HDD locations where the ROW changes direction. This allows the pipe to be prefabricated into one or more sections in preparation of the pull-back operation. Once assembled, the pipe is placed on rollers so it can be conveyed into the drill hole.

To facilitate HDD, an electric guide wire coil is typically placed along the ground surface between each HDD entry and exit point, where possible. This guide wire is used to assist in tracking the location of the down-hole drilling equipment and to determine steering inputs during advancement of the pilot bore. Wireline guidance systems typically require two guide wires for HDD crossings that parallel the centerline of an installation, with a variable spacing or offset on each side of the centerline, depending on the depth of the HDD installation.

Following completion of the pilot hole, reaming tools are used to enlarge the hole to accommodate the pipe diameter. The reaming tools are attached to the drill string at the exit point and then rotated and drawn back to incrementally enlarge the pilot hole. During this process, drilling mud consisting of bentonite clay and water is continuously pumped into the pilot hole to remove cuttings and maintain the integrity of the hole. When the hole has been sufficiently enlarged, a prefabricated segment of pipe is attached behind the reaming tool on the exit side of the crossing and pulled back through the drill hole towards the drill rig.

During construction, Transco will not clear any trees between the workspaces for HDD entry and exit sites. The only planned activity between HDD entry and exit points would be foot traffic to place electric guide wires that would be used to track the progress of the drilling operation. During operation Transco will not conduct any routine vegetation maintenance between HDD entry and exit sites.

If the HDD is unsuccessful, Transco will implement its HDD Contingency Plan for the Susquehanna River and Little Fishing Creek, which is included in Attachment 3 of the Transco ECP (**Attachment M**). **County-Specific Impact Mapping (Attachment H-3) is**

included for the contingency crossing methods in the case of an unsuccessful HDD. These drawings include E&S BMPs that are specific to the contingency crossing method, which are also included within the E&S Plans within Attachment M. Additionally, the Chapter 105 Impact Table (Attachment E-2) included temporary watercourse, wetland, and floodplain impacts that would be associated with the use of the contingency crossing methods, which will allow for the implementation of the contingency crossing methods without requiring the processing of major permit amendments prior to the initiation of the crossing method.

Unless otherwise approved, Transco will adhere to time of year restrictions on in-stream construction for those streams with trout designations as set by the PFBC. For streams identified by PFBC for having stocked sections within the Project, no in-stream work will occur from March 1 to June 15. For wild trout waters, no in-stream work will occur between October 1 and December 1. This restriction will be extended from October 1 to April 1 for those designated as Class A Wild Trout Streams. Transco has coordinated with the PFBC to confirm the time of year restrictions that are applicable to the streams crossed by the Project.

Watercourse Restoration and Compensatory Mitigation

Upon completion of in-stream construction, Transco will restore the stream bed and banks to minimize erosion, washouts, and associated turbidity and sedimentation. Transco will stabilize the stream bed and banks to preconstruction contours such that they are similar to banks at the limits of disturbance. Transco will also utilize pre-construction photographs. Banks will be stabilized using geotextile fabric. **Appendix L-3**, Table 1 identifies each watercourse and stream restoration detail to be utilized on either bank. A typical detail for streambed restoration is included in the BMPs and Quantities Plan Set within **Attachment M**. The streambed will be restored to grade using native streambed material. **To further stabilize the surface water banks, Transco will revegetate the banks and riparian areas in accordance with the Riparian Area Impact Assessment and Restoration Plan for Columbia County included in Appendix L-2.** If inclement weather limits the effectiveness of reseeding efforts, temporary erosion control measures will be implemented to minimize erosion until conditions are suitable for reseeding. The temporary erosion control measures will be monitored and maintained until conditions are suitable for completion of

restoration. No fertilizers, lime, or mulch will be utilized in riparian areas unless required in writing by the PA DEP and USACE permit requirements and the FERC order.

Following construction, disturbed areas adjacent to watercourses and bodies of water will be reseeded with approved seed mixes in accordance with the **Riparian Area Impact Assessment and Restoration Plan for Columbia County within Appendix L-2**. Trees and other woody vegetation will be allowed to reestablish naturally within the temporary ROWs and other temporary workspaces that were cleared for construction of the pipeline. The use of soil conservation techniques will avoid and/or minimize erosion and runoff that could potentially affect surface water quality.

No permanent fill will be placed in any watercourses as a result of this Project, and no stream relocation is expected. Therefore, no stream mitigation is proposed for this Project.

Floodplains

Fishing Creek, **Little Fishing Creek**, Hemlock Creek, Mud Run, Little Green Creek, Coles Creek, Mugser Run, Roaring Creek, Montour Run, Susquehanna River, UNT to Mud Run, South Branch Roaring Creek, **UNT South Branch Roaring Creek**, UNT to Little Fishing Creek, and West Creek have Federal Emergency Management Agency (FEMA) designated floodplains that are located within the construction workspace. PA DEP defines a regulatory floodway as a 50-foot buffer, which is established 50 feet from the delineated boundary of streams that do not have FEMA mapped 100-year floodplains (32 P.S. § 679.302 Chapter 106). Temporary impacts to floodways are expected from construction activities, but there will be no permanent loss of flood storage capacity as all pre-construction surface elevations will be re-established during restoration. **Temporary floodway impacts will be 48.8040 36.4245 acres. Of the total temporary impacts, 38.482426.4344 will be to FEMA mapped floodplains. Permanent floodway impacts will be 3.2286 2.5732 acres as a result of operation of the pipeline ROW. Of the total permanent impacts 2.2744 1.6533 will be to FEMA mapped floodplains.** These impacts are associated with vegetation management only and do not represent a permanent modification of ground elevation or loss of flood storage capacity. Impact details are included in Table L(d)-6. **As stated above, a Riparian Area Impact Assessment and Restoration Plan for the Project area in Columbia County is provided in Appendix L-2. The Riparian Area Impact Assessment and Restoration Plan for Columbia County**

includes measures for replanting and reestablishing the riparian buffer within the regulated floodplain (FEMA mapped 100-year floodplain or 50-foot-wide floodway if no FEMA-mapped floodplain is present, whichever is greater) (see **Appendix L-2**).

**Table L(d)-6
 Floodplain Impacts Associated With the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Floodway Type	Temporary Impact Dimensions ₄ (Length x Width) (Feet) ^{a,d}		Temporary Impact area (Acres)	Permanent Impact Dimensions ₄ (Length x Width) (Feet) ^a		Permane nt Impact area (Acres)	Latitude	Longitude
Floodway to UNT to Frozen Run	Floodway to WW-T01-12002	Assumed 50 Feet	66.45	52.15	0.0327	0.00	0.00	0.0000	41.00328	-76.50411
Floodway to UNT to Little Fishing Creek	Floodway to WW-T01-12005	Assumed 50 Feet	173.94	102.09	0.2132	112.15	10.00	0.0230	41.03610	-76.49025
Floodway to UNT to Little Fishing Creek	Floodway to WW-T01-12006	Assumed 50 Feet ^b	280.49	51.24	0.1734	0.00	0.00	0.0000	41.03974	-76.48685
Floodway to UNT to Little Fishing Creek	Floodway to WW-T01-13002	Assumed 50 Feet	304.19	124.41	0.2910	187.91	10.69	0.0322	41.06160	-76.47782
Floodway to UNT to Little Fishing Creek	Floodway to WW-T01-13003	Assumed 50 Feet	175.79	143.10	0.2497 0.2496	128.59	10.00	0.0258	41.06261	-76.47819
Floodway to Little Fishing Creek	Floodway to WW-T01-13004	Assumed 50 Feet	338.56	130.42	0.3194	177.85	14.27	0.0251	41.06753	-76.47391
Floodway to UNT to York Hollow	Floodway to WW-T02-14001	Assumed 50 Feet	32.85	3.25	0.0017	0.00	0.00	0.0000	41.25219	-76.42445
Floodway to UNT to Fishing Creek	Floodway to WW-T02-15002	Assumed 50 Feet	168.44	90.00	0.1874	133.28	5.00	0.0136	41.27303	-76.39555
Floodway to UNT to Fishing Creek	Floodway to WW-T02-15003	Assumed 50 Feet ^b	42.49 336.37	25.00 86.68	0.0205 0.1149	34.61 275.52	2.10 5.00	0.0016 0.0085	41.27327 41.27341	-76.38864 -76.38872
Floodway to UNT to Fishing Creek	Floodway to WW-T02-15005	Assumed 50 Feet	37.35	12.22	0.0052	0.00	0.00	0.0000	41.27319	-76.38627
Floodway to UNT to Fishing Creek	Floodway to WW-T02-15006	Assumed 50 Feet	132.21	90.71	0.0744	126.12	5.00	0.0049	41.27303	-76.38469
Floodway to Fishing Creek	Floodway to WW-T02-15007	FEMA Detailed	1227.59	928.23	4.3951 4.3982	1194.04 1200.46	89.44 89.65	0.1247 0.1254	41.27291	-76.38197
Floodway to UNT to East Branch Fishing Creek Floodway to UNT to Fishing Creek	Floodway to WW-T02-15008	Assumed 50 Feet	148.96 131.67	104.98 98.47	0.1976 0.1792	147.71 122.7	5.00 10.00	0.0115 0.0231	41.27497	-76.36928
Floodway to UNT to Coles Creek Floodway to UNT to Fishing Creek	Floodway to WW-T02-15009	Assumed 50 Feet	199.16	74.92	0.0918	96.92	0.47	0.0002	41.27615	-76.36351
Floodway to Hess Hollow	Floodway to WW-T02-15010	Assumed 50 Feet ^b	144.82	40.00	0.0488	50.32	4.13	0.0034	41.27799	-76.35279
Floodway to UNT to Hess Hollow	Floodway to WW-T02-15011	Assumed 50 Feet	177.63	69.65	0.0769	145.25	5.00	0.0010	41.27812	-76.35193
Floodway to Coles Creek	Floodway to WW-T02-15012	FEMA Detailed ^b	429.67	111.69	0.3885	341.00	5.00	0.0251	41.28169	-76.32906
Floodway to UNT to Coles Creek	Floodway to WW-T02-15013	Assumed 50 Feet	186.98	90.00	0.1989	161.87	5.00	0.0148	41.27947	-76.34376
Floodway to Ashelman Run	Floodway to WW-T02-15014	Assumed 50 Feet	167.49	90.00	0.1869	129.90	5.00	0.0134	41.28075	-76.33496
Floodway to UNT to Marsh Run	Floodway to WW-T02-15015	Assumed 50 Feet	97.96	37.81	0.0232	50.05	4.21	0.0040	41.28332	-76.31907
Floodway to Mugser Run	Floodway to WW-T04-11001	FEMA Detailed ^b	752.55	302.54 303.24	2.2649	745.57	97.21	0.1666	40.87835	-76.48641
Floodway to UNT to Roaring Creek	Floodway to WW-T04-11002	Assumed 50 Feet	1037.07	291.00	0.6972	130.44	10.00	0.0258	40.88601	-76.48611
Floodway to Susquehanna River	Floodway to WW-T04-12001	FEMA Detailed	1452.00 1960.20	400.00 50.00	3.1729 ^c 0.7714	370.26 947.47	10.00	0.0840 0.1920	40.95034 40.95028	-76.48490 -76.48468
Floodway to UNT to Montour Run	Floodway to WW-T04-12002	Assumed 50 Feet	538.49	159.72	0.3584 0.3565	275.12 283.97	22.99 23.12	0.0502 0.0518	40.97652	-76.49814
Floodway to Montour Run	Floodway to WW-T04-12005	FEMA Detailed ^b	269.70	99.67	0.1677	155.95	10.00	0.0259	40.97699	-76.49838
Floodway to UNT to Montour Run	Floodway to WW-T04-12005A	Assumed 50 Feet	141.58	111.31	0.2131	133.80	10.00	0.0257	40.97743	-76.49868

**Table L(d)-6
 Floodplain Impacts Associated With the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Floodway Type	Temporary Impact Dimensions ₄ (Length x Width) (Feet) ^{a,d}		Temporary Impact area (Acres)	Permanent Impact Dimensions ₄ (Length x Width) (Feet) ^a		Permane nt Impact area (Acres)	Latitude	Longitude
Floodway to UNT to Montour Run	Floodway to WW-T04-12006	Assumed 50 Feet ^b Assumed 50 Feet	315.86 343.51	106.97 121.73	0.4293 0.3498	244.95 245.77	10.00	0.0449 0.0426	40.98219	-76.49921
Floodway to UNT to Deerlick Run	Floodway to WW-T06-13001	Assumed 50 Feet	249.44	104.55	0.2942	170.71	10.00	0.0347	41.07602	-76.46863
Floodway to UNT to Deerlick Run	Floodway to WW-T06-13002	Assumed 50 Feet ^b	255.96	100.00	0.2418	184.57	10.00	0.0291	41.07998	-76.46833
Floodway to West Creek	Floodway to WW-T06-14001	FEMA Detailed ³	550.29	150.00	1.2574	511.84	17.08	0.1110	41.26719	-76.41055
Floodway to West Creek	Floodway to WW-T06-14002	Assumed 50 Feet	118.57	51.58	0.1007	54.54	10.00	0.0119	41.26642	-76.41164
Floodway to UNT to Green Creek	Floodway to WW-T15-14002	Assumed 50 Feet	89.53	26.95	0.0277	0.00	0.00	0.0000	41.19701	-76.43353
Floodway to UNT to Green Creek	Floodway to WW-T15-14003	Assumed 50 Feet	142.50	132.27	0.2260	128.28	10.00	0.0256	41.19815	-76.43368
Floodway to UNT to Green Creek	Floodway to WW-T15-14005	Assumed 50 Feet ^b	159.36	100.00	0.1929	129.98	10.00	0.0238	41.20657	-76.43254
Floodway to Green Creek	Floodway to WW-T15-14007	Assumed 50 Feet ^b	182.50	141.57	0.2435	136.02	10.00	0.0273	41.20818	-76.42977
Floodway to UNT to Green Creek	Floodway to WW-T15-14008	Assumed 50 Feet ^b	204.32	102.38	0.2139	147.20	10.00	0.0245	41.22369	-76.42678
Floodway to UNT to Green Creek	Floodway to WW-T16-14001	Assumed 50 Feet ^b	206.13	87.14	0.2252	108.97	10.00	0.0223	41.15234	-76.43391
Floodway to UNT to Green Creek	Floodway to WW-T16-14002	Assumed 50 Feet ^b	339.54	126.42	0.2029	81.61	10.00	0.0138	41.18094	-76.43643
Floodway to Little Green Creek	Floodway to WW-T16-14003	FEMA Detailed	417.25	127.37	0.6236 0.5509	400.38 325.47	10.00	0.0742 0.0644	41.14463 41.14459	-76.43665 -76.43671
Floodway to UNT to York Hollow	Floodway to WW-T17-14001	Assumed 50 Feet	364.74	121.31	0.2940	178.71	18.37	0.0350	41.24264	-76.42670
Floodway to UNT to York Hollow	Floodway to WW-T17-14002	Assumed 50 Feet	449.58 237.58	119.50 118.85	0.2319 0.2214	112.57 113.52	10.00	0.0235 0.0237	41.24974	-76.42543
Floodway to York Hollow	Floodway to WW-T17-14003	Assumed 50 Feet	232.17	171.65	0.3372	130.10	10.00	0.0275	41.25045	-76.42414
Floodway to York Hollow	Floodway to WW-T17-14003	Assumed 50 Feet	122.83 124.69	119.82 124.44	0.1229	0.00	0.00	0.0000	41.25027	-76.42410
Floodway to Mud Run	Floodway to WW-T21-13001	FEMA Detailed	337.17	162.61	0.6618	320.75	10.00	0.0670	41.11986	-76.45089
Floodway to UNT to Mud Run	Floodway to WW-T21-13001A	FEMA Detailed	496.01	267.31	1.2988	443.02	101.13	0.1036	41.12093	-76.44939
Floodway to UNT to Montour Run	Floodway to WW-T28-12002	Assumed 50 Feet ^b	47.43	10.31	0.0074	0.00	0.00	0.0000	40.97476	-76.49657
Floodway to UNT to Roaring Creek	Floodway to WW-T28-12004	Assumed 50 Feet	128.44	112.46	0.2096	120.29	10.00	0.0234	40.89266	-76.48730
Floodway to UNT to Roaring Creek	Floodway to WW-T28-12005	Assumed 50 Feet	134.37	100.00	0.2082	115.62	10.00	0.0234	40.89054	-76.48735
Floodway to UNT to Mugser Run	Floodway to WW-T31-11001	Assumed 50 Feet	199.39	100.00	0.2446	137.06	10.00	0.0250	40.87439	-76.48443
Floodway to Roaring Creek	Floodway to WW-T35-11001	FEMA Detailed ^b	708.75	142.92	1.4504	696.31	10.00	0.1372	40.89862	-76.48735
Floodway to UNT to Deerlick Run	Floodway to WW-T35-13001	Assumed 50 Feet	361.86	100.00	0.2264	295.95	10.00	0.0351	41.09849	-76.46082
Floodway to Deerlick Run	Floodway to WW-T35-13002	Assumed 50 Feet	136.61	100.00	0.1581	116.63	10.00	0.0209	41.09462	-76.46469
Floodway to South Branch Roaring Creek	Floodway to WW-T44-11001	FEMA Detailed ^b	311.19	150.00	0.5610	306.33	10.00	0.0492	40.85479	-76.49852
Floodway to South Branch Roaring Creek	Floodway to WW-T45-11001	FEMA Detailed	100.51	81.11	0.0593	32.22	10.00	0.0073	40.83992	-76.50717
Floodway to UNT to South Branch Roaring Creek	Floodway to WW-T47-11001	FEMA Detailed ^b	210.17	100.00	0.2658	203.39	10.00	0.0262	40.84917	-76.50304

**Table L(d)-6
 Floodplain Impacts Associated With the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Floodway Type	Temporary Impact Dimensions ₄ (Length x Width) (Feet) ^{a,d}		Temporary Impact area (Acres)	Permanent Impact Dimensions ₄ (Length x Width) (Feet) ^a		Permane nt Impact area (Acres)	Latitude	Longitude
Floodway to UNT to South Branch Roaring Creek	Floodway to WW-T47-11001A	Assumed 50 Feet	51.27	39.53	0.0220	0.00	0.00	0.0000	40.84901	-76.50311
Floodway to South Branch Roaring Creek	Floodway to WW-T51-11001	Assumed 50 Feet	161.18	108.03	0.1860	104.55	10.00	0.0168	40.84003	-76.50668
Floodway to UNT to Little Fishing Creek	Floodway to WW-T52-13001	FEMA Detailed ^b	41.70	13.04	0.0079	0.00	0.00	0.0000	41.04721	-76.48758
Floodway to UNT to Green Creek	Floodway to WW-T67-13001	Assumed 50 Feet	116.00	55.89	0.1152 0.1246	0.00	0.00	0.0000	41.21251	-76.42413
Floodway to UNT to Green Creek	Floodway to WW-T67-13002	Assumed 50 Feet	97.29	39.51	0.0630	0.00	0.00	0.0000	41.21243	-76.42463
Floodway to UNT to Hemlock Creek	Floodway to WW-T70-12001	Assumed 50 Feet	196.53	38.52	0.0733	0.00	0.00	0.0000	41.00507	-76.49128
Floodway to Hemlock Creek	Floodway to WW-T70-12003	FEMA Detailed ^b	356.58	124.44	0.3256	306.28	37.33	0.0389	41.00323	-76.49387
Floodway to Hemlock Creek	Floodway to WW-T70-12003	FEMA Detailed	580.61	74.40	0.0537 0.0471	0.00	0.00	0.0000	41.00471	-76.49467 -76.49468
Floodway to UNT to Hemlock Creek	Floodway to WW-T70-12003A	Assumed 50 Feet	7.87	0.95	0.0570 0.0004	0.00	0.00	0.0000	41.00328	-76.49409
Floodway to UNT to Hemlock Creek	Floodway to WW-T70-12003A	Assumed 50 Feet	114.61	24.07	0.0570	0.00	0.00	0.0000	41.00341	-76.49417
Floodway to Fishing Creek	Floodway to WW-T70-12006	FEMA Detailed	3882.29 3878.35	784.94 765.68	10.6348 10.6305	2992.33	551.86	0.5133 0.5135	41.01647 41.02241	-76.47557 -76.47834
Floodway to Fishing Creek	Floodway to WW-T70-12006	FEMA Detailed	637.10	84.98	0.6912	0.00	0.00	0.0000	41.01555	-76.47570
Floodway to Fishing Creek	Floodway to WW-T70-12006	FEMA Detailed	605.60	65.34	0.6069	0.00	0.00	0.0000	41.02414	-76.47776
Floodway to Fishing Creek	Floodway to WW-T70-12006	FEMA Detailed	84.98	15.00	0.0290	0.00	0.00	0.0000	41.01647	-76.47557
Floodway to UNT to Fishing Creek	Floodway to WW-T70-12011	Assumed 50 Feet	271.89 283.01	86.04	0.1760 0.2063	91.39	10.00	0.0150	41.01534 41.01519	-76.47647 -76.47630
Floodway to UNT to Little Fishing Creek	Floodway to WW-T70-12012	Assumed 50 Feet	224.95	104.73	0.2480	163.29	10.00	0.0304	41.02413	-76.48294
Floodway to UNT to Deerlick Run	Floodway to WW-T90-13001	Assumed 50 Feet	247.97	60.45	0.1814	218.05	17.04	0.0454	41.08450	-76.46796
Floodway to UNT to Mud Run	Floodway to WW-T90-14003	Assumed 50 Feet	216.13	100.00	0.1986	133.94	10.00	0.0237	41.11917	-76.45154
Floodway to UNT to West Creek	Floodway to WW-T91-15001	Assumed 50 Feet ^b	30.27	21.87	0.0074	6.36	2.36	0.0002	41.27300	-76.40286
Floodway to UNT to Fishing Creek	Floodway to WW-T91-15003	Assumed 50 Feet	18.77	0.86	0.0002	0.00	0.00	0.0000	41.27345	-76.38519
Floodway to UNT to Coles Creek Floodway to UNT to Fishing Creek	Floodway to WW-T91-15004	Assumed 50 Feet	211.83	90.00	0.2461	129.23	10.00	0.0263	41.27558	-76.36431
Floodway to UNT to Fishing Creek	Floodway to WW-T92-15001B	Assumed 50 Feet	90.00	77.82	0.0913	58.20	5.00	0.0066	41.27292	-76.38284
Floodway to UNT to Coles Creek	Floodway to WW-T92-15002	Assumed 50 Feet	253.57	91.41	0.1405	34.71	4.54	0.0017	41.28192	-76.32739
Floodway to UNT to Marsh Run	Floodway to WW-T93-15001	Assumed 50 Feet	105.03	52.74	0.0499	45.77	1.53	0.0011	41.28354	-76.31641
Floodway to UNT to Montour Run	Floodway to WW-T04-12007	Assumed 50 Feet	144.67	114.08	0.2332	138.79	10.00	0.0259	40.98807	-76.49796
Floodway to Little Fishing Creek	Floodway to WW-T81-13001	FEMA Detailed^b	3007.26	614.86	8.2384	2846.40	526.83	0.7202	41.04131	-76.48522
Floodway to Little Fishing Creek	Floodway to WW-T81-13001	FEMA Detailed^b	308.84	44.97	0.1487	0.00	0.00	0.0000	41.03924	-76.48588
Floodway to UNT to York Hollow	Floodway to WW-T17-14002	Assumed 50 Feet	80.83	31.70	0.0423	0.00	0.00	0.0000	41.24993	-76.42415
Floodway to UNT to York Hollow	Floodway to WW-T17-14002	Assumed 50 Feet	184.92	45.69	0.0933	0.00	0.00	0.0000	41.24993	-76.42415

**Table L(d)-6
 Floodplain Impacts Associated With the Atlantic Sunrise Project in Columbia County**

Resource ID	Resource Name	Floodway Type	Temporary Impact Dimensions ₄ (Length x Width) (Feet) ^{a,d}		Temporary Impact area (Acres)	Permanent Impact Dimensions ₄ (Length x Width) (Feet) ^a		Permane nt Impact area (Acres)	Latitude	Longitude
Floodway to Susquehanna River	Floodway to WW-T04-12001	FEMA Detailed	1752.83	335.9	0.9823	0.00	0.00	0.0000	40.95229	-76.48139
Floodway to Susquehanna River	Floodway to WW-T88-004	FEMA Detailed	202.93	130.45	0.2046	0.00	0.00	0.0000	40.95336	-76.46559
Floodway Impacts					48.8040 36.4245			3.2286 2.5732		
<p>a: Widths are reported as the maximum width for the feature. Stream lengths are reported on the impact maps as the sum of the permanent and temporary lengths. b: Multiple streams are included in these calculations as the floodways overlap. c: This feature will be crossed using an HDD within the LOD shown on the drawing. However, the impacts shown are for the contingency, or secondary, crossing method, since those impacts are larger. The drawing showing the LOD and resource impacts for the contingency crossing method is provided in Attachment H-3. d: See Attachment E-2 footnotes for a description of temporary impacts in the floodway associated with access roads.</p>										

B1a. Food Chain Production

Most of the watercourses crossed by the Atlantic Sunrise Project are minor and intermediate streams, which have food chains that are driven by detrital input from riparian vegetation, rather than phytoplankton. Therefore, temporary increases in sediment load will not have an adverse effect on the trophic structure of the streams. It is unlikely that temporary increases in turbidity will have an adverse effect on aquatic biota of the area, especially since many of these watercourses may already be turbid and/or are subjected to higher turbidity levels from precipitation-based run-off. As such, the existing in-stream communities are adapted to living in turbid conditions. Oxygen levels will begin to return to normal within hours of the completion of in-stream construction as the sediment settles. Effects will generally be limited to the short period of in-stream construction, and conditions are expected to return to normal following stream restoration activities. To minimize these effects, Transco will implement BMPs to control erosion and sediment run-off from workspaces.

In particular, the following measures specific to watercourse crossings will be implemented, as appropriate:

- Sediment barriers will be installed across the entire construction ROW at all watercourse crossings where necessary to prevent the flow of sediments into the watercourse. In the travel lane, these may consist of removable sediment barriers or drivable berms. Removable sediment barriers may be removed during the construction day, but will be re-installed after construction has stopped for the day or when heavy precipitation is imminent;
- Where watercourses are adjacent to the construction ROW, sediment barriers will be installed along the edge of the construction ROW as necessary to contain spoil and sediment within the construction ROW;
- Trench plugs will be used at all watercourse crossings as necessary to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the watercourse, unless otherwise approved by the on-site environmental inspector to allow natural flow of water into the watercourse; and
- Applicable watercourse setbacks will be maintained until construction-related ground-disturbing activities are complete. The setback distances vary based on the type of activity being performed, but all will be clearly marked in the field with signs and/or highly visible flagging prior to pipeline construction.

B1b. General Habitat (including Nesting, Spawning, Rearing, Resting, Migration, Feeding, and Escape Cover)

Within the Atlantic Sunrise Project area throughout Pennsylvania, general temporary construction-related impacts on wildlife species will be related to habitat disturbance and human activities, while permanent impacts are those associated with the conversion of forest habitats to open or scrub-shrub areas because of construction and maintenance of the permanent ROW. Indirect impacts on wildlife include those associated with increased human activity. Construction of the Project likely will result in the temporary displacement of or stress on animals in areas adjacent to construction and cause movement of some wildlife away from the Project area. Stress on wildlife could affect general health, reproduction, and viability of young, depending on the sensitivity of a particular species, season of the year, and other factors. Other temporary impacts on wildlife species include those from pipeline trenching activities and associated spoil piles, which could result in a short-term barrier to movement to some species. During clearing and grading activities, more mobile wildlife species (e.g., larger mammals, birds, and reptiles) will be able to avoid the construction area, and many are expected to leave the area during construction. Construction activity will be temporary and will stay in a given area for only a few weeks, at most. Habitat recovery will occur to the maximum extent possible, aided by the use of the impact minimization and restoration measures outlined in the ECP (**Attachment M**).

Direct and long-term impacts on wildlife habitat resulting from construction and operation of the proposed Project will include the clearing of uplands, wetlands, and riparian areas required for temporary workspace and new permanent easement. Where feasible, Transco has routed the pipeline to follow existing corridors (and thus follow existing forest edges). The direct removal of vegetation has the potential to reduce the amount of available habitat, food resources, and cover. An important effect of vegetation removal is habitat fragmentation. Habitat fragmentation occurs as larger areas of habitat are reduced and/or split into smaller non-contiguous areas by development. Besides the direct loss of habitat, habitat fragmentation can also cause change in habitat vegetation composition (which could include the introduction of noxious and/or invasive species). It is not anticipated that wildlife populations that utilize the Project area will be permanently adversely affected by the proposed Project. While temporary impacts on food, cover, and water sources may occur, none of the species located within the Project area are

specialized in such a way that construction of the Project will inhibit the overall fitness or reproductive output of the populations as a whole.

Temporary habitat alteration at the crossing location, and increased suspended solids concentrations and sedimentation downstream from the crossing may temporarily degrade fish spawning and nursery areas, resulting in a temporary reduction in reproductive potential. Transco expects these effects to be temporary in nature because the suspended sediments will be flushed by the existing currents or settle out, and aquatic communities will subsequently recolonize the affected area.

Permanent impacts to spawning, however, are not anticipated as a result of this Project. Impacts to spawning should be mitigated by timing construction outside of the restricted period for activities within Wild Trout and Class A Wild Trout streams. Transco coordinated with the PFBC to confirm the time of year restrictions that are applicable to the streams crossed by the Project.

B1c. Habitat for Threatened and Endangered Plant and Animal Species

Transco has consulted with the PA Department of Conservation and Natural Resources, PA Game Commission, PFBC, and United States Fish and Wildlife Service (USFWS) regarding federal and state-listed threatened and endangered species in the Project area. A summary of this correspondence is included in **Attachment G** of this permit application package.

B1d. Environmental Study Areas

The Project will not affect any locations in which environmental studies are known to be taking place.

B1d1. Sanctuaries

The Project will not affect sanctuaries in **Columbia County**.

B1d2. Refuges

The Project will not affect refuges in **Columbia County**.

B2. Water Quantity and Streamflow

B2a. Natural Drainage Patterns

It is anticipated that the Project will not impact natural drainage patterns. The stormwater management controls included in the Project (discussed in **Attachment M**, ECP) have been designed to maintain natural or current drainage characteristics, as appropriate.

B2b. Flushing Characteristics

It is not anticipated that the Project will impact flushing characteristics.

B2c. Current Patterns

The Project may have minor, localized temporary effects on current patterns in the immediate vicinity of the proposed stream crossings during construction but will be minimized where possible through the appropriate implementation of BMPs based upon calculations completed in accordance with PA DEP Chapter 102. Permanent impacts to current patterns are not anticipated as all disturbed areas will be restored to pre-construction conditions.

B2d and e. Groundwater Discharge for Baseflow and Natural Recharge Area for Ground and Surface Waters

The Project is not expected to impact any potable water intakes or public water supplies which rely on groundwater recharge. Transco identified potable and non-potable surface water intake structures in proximity to the Project using eMapPA. Across the Project, nineteen surface water intakes were identified less than 3 miles downstream of Project watercourse crossings using eMapPA. Of the 19 surface water intakes identified, the primary uses were identified as agriculture (12), commercial (1), industrial (2), mineral (1), and oil/gas (3). Based on their primary uses, it is unlikely that the 18 non-commercial surface water intakes are used for potable water. Transco verified that these 18 intakes are not listed in Pennsylvania's Drinking Water Reporting System, indicating these intakes are not public water supplies and are, therefore, not used as community potable water sources. The single commercial surface water intake is located in Wyoming County.

Additionally, Transco requested information from the PA DEP Northcentral Regional Office regarding surface water intakes. The PA DEP Northcentral Region's response did not identify

additional public water supplies within the vicinity of the Project and did not identify public water supplies with Zone A Source Water Protection Areas crossed by the Project (Hamilton 2015).

Through public comments on the Project, Transco identified the Suez Water Authority operates a surface water intake in the Project vicinity as part of their Bloomsburg, PA water treatment facility. As identified on the updated Project Location Map, this surface water intake is on Fishing Creek and is located 1.2 miles downstream from the Project. Correspondence to date with Suez Water Authority is presented in Table L(d)-7.

Transco prepared a notification plan to be used in the event of a spill upstream from the Suez Water Authority water intake. The Suez Water Authority Notification Plan details Transco's procedures in the event of a spill, including emergency response and reporting. Transco has provided a copy of the notification plan to Suez Water Authority.

Table L(d)-7		
Suez Water Authority Communication Summary		
Date	Communication Initiated	Result
July 21, 2016	Transco completed a phone conversation with Tate Hunsinger, Company Superintendent	Mr. Hunsinger provided the approximate location of water intake and provided contact information for the Notification Plan
October 17, 2016	Transco provided the Notification Plan to the Suez Water Authority for comment	Transco received a response from Mr. Hunsinger and incorporated his comments into the final plan

Potential impacts to the Suez Water Authority water intake will be avoided by implementing Transco's Spill Plan (Attachment 9 of the ECP, provided within **Attachment M**) and the Suez Water Authority Notification Plan in the event of a spill upstream from the intake. Transco will follow the spill prevention practices enumerated in the Spill Plan, which include proper container and tank storage and inspection instructions, loading/unloading procedures, and spill response kit specifications. Refueling and transferring of liquids will occur only in pre-designated locations

that are on level ground and at least 100 feet from any wetland or watercourse, thereby preventing contamination of watercourses. As stated in the Spill Plan, Transco will maintain and immediately respond to spills as appropriate to the situation, with responses ranging from the use of absorbent pads to the employment of an emergency spill response contractor.

Transco will avoid potential impacts to distal public water supplies within Columbia County by using dry-ditch crossing methods and implementation of all erosion and sediment control plans as specified in the Transco Procedures. During construction, Transco will adhere to all measures in the Transco Procedures (Attachment 18 of the ECP), which will minimize sedimentation and turbidity, minimize streambed and bank disturbance, and limit the time it takes to complete in-stream construction. Transco will cross watercourses with flowing water present at the time of construction using dry-ditch or trenchless construction methods to the greatest extent practicable. To minimize sedimentation during pipeline construction across each watercourse, trench spoil will be placed at least 10 feet away from water's edge, unless impractical due to topography. Erosion controls will be placed around spoil piles to prevent sediment from flowing into watercourses.

B2f. Storm and Flood Water Storage and Control

It is not anticipated that the Project will adversely impact storm and flood water storage and control. Transco has developed a Post Construction Stormwater Management Plan in accordance with PA DEP Chapter 102 to prevent impacts to stormwater discharges and control. There will be no loss of flood storage capacity within designated floodways as pre-construction surface contours will be restored.

B3. Water Quality

B3a. Preventing Pollution

Construction activities can disturb surface soils and cause subsequent sediment transport into adjacent wetlands. Sedimentation will be minimized by the installation of temporary sediment control measures between the upland construction areas and the wetlands. Permanent erosion controls, including slope breakers, trench breakers, and vegetative cover, will be used in adjacent upland areas to minimize long-term sedimentation into the wetlands. Energy dissipation devices may be installed at the down-slope end of slope breakers to minimize

erosion of soil off the ROW into wetlands. Trench plugs will be installed in upland slopes adjacent to wetlands to prevent trench erosion and siltation

To minimize erosion and promote revegetation within the wetland, removal of the root mats for woody vegetation will be allowed only directly over the trench area or where required to ensure safe working conditions. This serves to enhance regeneration of vegetation on the construction and permanent ROW. Permanent erosion control structures that could alter hydrology (e.g., slope breakers) will not be installed within wetlands, but these structures will be used in the adjacent upland areas to control erosion and sedimentation. Transco will employ BMPs as specified in erosion and sediment control permits and approved by PA DEP to further minimize the potential for soil compaction.

Turbidity and sedimentation could result from in-stream construction activities, trench dewatering, and/or construction-related stormwater runoff. In slow-moving waters, increases in suspended sediments could increase the biological oxygen demand and reduce levels of dissolved oxygen in localized areas during construction. Suspended sediments also could alter the chemical and physical characteristics of the water column on a temporary basis.

Transco will cross surface waters with flowing water present at the time of construction using dry-ditch construction methods to the greatest extent practicable. Dry-ditch crossing methods can dramatically reduce downstream sediment transport effects compared to wet open-cut crossings. Transco will employ BMPs as specified in Transco's Erosion and Sediment Control General Permit 2 (ESCGP-2) application, which contains site-specific erosion and sediment control plan to further minimize the potential for soil compaction.

Transco will also install temporary equipment bridges across surface waters to reduce the potential for turbidity caused by movement of construction equipment and vehicular traffic. Equipment bridges will be constructed timber mats or portable prefabricated bridges, depending on surface water conditions (e.g., if excessively soft soils are encountered in the surface water bed, or if high water flows occur, portable bridges will be used at minor surface water crossings). Typical drawings for equipment bridges are provided in Attachment 2 of the Transco ECP (**Attachment M**). Equipment bridges will be maintained until the pipe is installed and they are no longer needed. The bridges will then be removed. Equipment bridges will be designed to

accommodate normal to high surface water flow and will be maintained to prevent flow restriction during the period of time the bridge is in use during construction.

To minimize sedimentation during pipeline construction across each watercourse, trench spoil will be placed at least 10 feet away from water's edge, unless impractical due to topography, as specified in the Transco Procedures (Attachment 18 of the Transco ECP (**Attachment M**)). Erosion controls will be placed around spoil piles to prevent sediment from flowing into surface waters. ATWS will typically be set back 50 feet from the water's edge unless otherwise approved by applicable regulatory agencies.

Once the pipe is placed in the trench, the excavated material will be replaced immediately, and the surface water banks and bed will be restored to preconstruction contours. To stabilize the banks, the surface water banks and riparian areas will be revegetated using approved seed mixes and/or erosion control blankets or matting **in accordance with the Riparian Area Impact Assessment and Restoration Plan for Columbia County within Appendix L-2.**

B3b. Sedimentation Control and Patterns

The Project ECP and associated plans describe techniques that will be used to minimize erosion and release of sediments during and following Project construction. The ECP is included as **Attachment M**.

Post-construction stormwater management measures will also be implemented for water quality in areas where it is required. For the pipeline portion of the Project, no new impervious surfaces are proposed. The Post Construction Stormwater Management Plan is designed to manage stormwater runoff associated with new impervious areas (gravel) for the proposed aboveground facilities. With the implementation of the E&S Pollution Control Plan and the stormwater management measures, water quality impacts are not anticipated.

B3c. Salinity Distribution

This section is not applicable to the proposed Project in **Columbia County.**

B3d. Natural Water Filtration

Watercourses and wetlands in the Project area have some function in water filtration; however, impacts to these features will be temporary and natural water filtration capabilities will be restored.

B4. Recreation

B4a and b. Game and Non-Game Species

Within the Atlantic Sunrise Project area throughout Pennsylvania, construction of the pipeline facilities will negatively affect wildlife and wildlife habitat short-term within the immediate vicinity of open land along the pipeline route, which predominantly consists of existing ROWs. Effects will include disturbance due to clearing and trench excavation. This will affect less mobile species, including those that hide within burrows along the route, to a greater degree than those that can quickly flee the Project area. Following construction activities, the existing ROWs will be restored to preconstruction conditions to the extent practicable, and it is expected that wildlife will quickly return to the vicinity of the ROWs, using them as corridors for travel, refuge, foraging, and nesting. Following construction, these ROWs will be maintained in a manner similar to current conditions.

Construction within forested land will cause temporary effects on local wildlife populations, because forested habitat will be converted to successional stages of open herbaceous and scrub-shrub habitat for several years to decades until a mature forest community redevelops. During this time there is a risk of intrusion by invasive or noxious species. To mitigate against this risk, Transco will manage invasive and noxious species according to the Noxious and Invasive Management Plan included as Attachment 11 of the ECP (**Attachment M**).

Some wildlife species that rely on forested habitat may be negatively affected by the temporary loss of forest. Removal of vegetation within forested land could cause long-term displacement of some local wildlife populations. However, any such impacts, while adverse, are expected to be highly localized and unlikely to have any population-level impacts based on the presence of suitable adjacent habitat for use. In addition, other wildlife species that prefer open land and scrub-shrub habitat will benefit from the temporary habitat conversion. As referenced in **Attachment L**, Enclosure C, Section A2a through A2g, Transco is developing a Memorandum

of Agreement (MOA) with the USFWS addressing conservation measures for migratory birds in the Project area. The MOA includes mitigation for removal of upland forest and forest fragmentation.

Transco does not expect significant direct mortality of wildlife to occur as a result of construction activities. Transco anticipates that the majority of wildlife will disperse from the vicinity of construction activities in response to disturbance from construction vehicles and equipment. Construction vehicles will adhere to low speed limits along all access roads to avoid wildlife mortality.

Following construction, the temporary workspaces outside the aboveground facility fence lines will be maintained in a manner similar to preconstruction conditions. Therefore, effects on wildlife in agricultural lands and open lands that are within temporary workspaces for aboveground facilities will be temporary, and these habitats are expected to recover within weeks to months following construction.

B4c. Fishing

Temporary impacts to streams during construction activities may temporarily affect fishing opportunities; however, no permanent impacts are anticipated within **Columbia County**.

B4d and e. Hiking and Observation (wildlife)

No impacts to hiking or observation are expected as the Project does not cross any federal, state or local recreation areas.

B4f. Other

Transco has initiated coordination with PFBC regarding the need to prepare site-specific Aids to Navigation (ATON) plans for each of the crossings which have been identified by PFBC as being recreationally navigable. Within the Project limits of Columbia County, these include: Fishing Creek, the Susquehanna River, South Branch Roaring Creek (2 locations), and Roaring Creek. Transco prepared and submitted ATON plans in accordance with PFBC guidelines including the use of buoys, signage, and portage, as necessary. Through a coordination meeting with PFBC, it was noted that the proposed crossing of South Branch Roaring Creek is likely not within the recreationally navigable reach of the stream, but further evaluation would be

completed during the ATON Plan review process. Transco submitted the ATON plans to PFBC on October 4, 2016, **which were subsequently approved by the PFBC on January 20, 2017. A copy of the ATON applications and PFBC approval is included within Appendix L-6. and will provide copies of the ATON approvals to PA DEP as received.** Transco is currently coordinating with the PFBC on the new crossings associated with the recent Management of Changes that are included within this revised application. The list of new stream crossings was submitted to the PFBC on April 26, 2017 for their review and determination of additional ATONs. Should additional ATONs be required for the revised Project footprint, Transco will provide the revised ATON application(s) and PFBC approval upon receipt. **The list of new streams provided to PFBC included one stream in Columbia County for water withdrawal activities.** Transco will implement the approved plans during construction to minimize impacts to recreational boaters within the Project area.

B5. Upstream and Downstream Property

The implementation of the Project-specific ECP will minimize the impacts to properties upstream and downstream of the Project. The ECP is included in **Attachment M**.

B6. Other Environmental Factors

Selection of the proposed pipeline route was partially based on landowner preference, as well as avoidance of environmental impacts to resources such as watercourses and wetlands. The route minimized impacts to these features as much as possible and still fulfills the purpose and needs of the Project. Specific routing criteria is discussed in the Alternatives Analysis (**Attachment P-1**).

C. Environmental Impacts on Other Adjacent Land and Water Resources

Construction impacts to adjacent properties and water resources will be minimized through the use of the Project-specific ECP. This plan will conform to federal, state, and local regulations and prevent movement of sediment off the construction site. Stormwater generated on-site during construction will also be managed and released in a manner that conforms to applicable federal, state, and local regulations.

D. Cumulative Environmental Impacts

Cumulative effects may result when the environmental effects associated with construction and operation of a proposed Project are added to the environmental effects of other Projects or activities occurring in the same area. The United States Environmental Protection Agency (USEPA) guidelines state:

“Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that should be the focus of cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time.” (USEPA 1999).

To identify and assess potential cumulative effects of the Project, Transco is considering other past, present, and reasonably foreseeable Projects and other human-related activities near the Project facilities. The Comprehensive Environmental Evaluation for the Central Penn Line provided in **Appendix L-1** includes a summary of cumulative impacts for the Project as whole.

The existing conditions in the Project area reflect changes from past and present activities. Although much of the area is rural and relatively undeveloped, substantial alterations to the natural environment have occurred due to agriculture, mining, transportation Projects, and other development. The potential for cumulative effects from the Project exists for the following resources: groundwater, consumptive water use, surface water, vegetation, wildlife (federally and state-protected species of flora and fauna), cultural resources, socioeconomics, geology, soils, land use, air quality, and noise.

Transco has identified past, present, and reasonably foreseeable Projects and other human-related activities occurring in the vicinity of the Project (within 10 miles) that may result in cumulative effects when combined with the effects of the Project. Transco consulted with the affected municipal and county planning agencies to identify Projects in the vicinity of the Project. Transco also identified other activities, such as residential Projects located within a 0.5-

mile radius of the Project, as well as transportation and energy development Projects located within a 10-mile radius of the Project.

The assessment of cumulative effects assumes that Project effects are minimized by the successful implementation of the environmental protection and mitigation measures described in the Transco ECP and compliance with applicable standard practices and federal, state, and local regulations and permit requirements.

The assessment area for potential cumulative effects includes the area directly affected by construction of the Project facilities in addition to the anticipated area of effect the Project may have on each resource. This assessment area varies for each resource, based on the potential for effects to extend beyond the area of direct effect. For example, effects on air quality have the potential to extend beyond the Project boundaries, but effects on geologic and soil resources would likely not extend beyond the construction boundaries. Cumulative effects are considered in the context of the appropriate geographic area of potential effect (e.g., watershed boundaries for water quality and use, and county boundaries for socioeconomics).

Water Use and Quality

This section addresses past, present, and reasonably foreseeable actions that, when taken into consideration with the Project, could result in cumulative effects on water quality and use. Potentially affected water resources include groundwater, surface water crossings, groundwater and surface water withdrawals, watercourses, and wetlands. The geographic area considered in the evaluation includes the watershed basin within the Project effect area. Potential cumulative effects resulting from construction activities and operations and maintenance have been considered as part of this analysis.

This analysis considered effects from other Projects within the same watershed (8-digit Hydrologic Unit Code [HUC]) and within 10 miles of the Project activities. The Project pipeline facilities cross two major watershed subregions (i.e., 4-digit HUCs) as defined by the United States Geological Survey (USGS) (USGS 2013b): the Susquehanna River subregion in Pennsylvania and the Potomac River subregion in Virginia. The Project pipeline facilities cross four major watershed basins (i.e., 6-digit HUCs): the Upper Susquehanna, the Lower Susquehanna, and the West Branch Susquehanna in Pennsylvania, and the Potomac in

Virginia. The Project pipeline facilities cross eight watershed subbasins (i.e., 8-digit HUCs): the Upper Susquehanna-Lackawanna, the Upper Susquehanna-Tunkhannock, the Lower Susquehanna, the Lower Susquehanna- Swatara, the Lower Susquehanna-Penns, the Middle West Branch Susquehanna, and the Lower West Branch Susquehanna in Pennsylvania, and the Middle Potomac-Anacostia- Occoquan in Virginia.

Shallow (perched) aquifers could sustain effects from temporary changes in overland water flow and recharge caused by clearing and grading of the ROWs and temporary workspaces. In forested areas, water infiltration, which is normally enhanced by vegetation, will be reduced until vegetation is reestablished. In areas where groundwater is encountered within the open trench, dewatering may result in a minor, temporary fluctuation in local groundwater levels. On occasion, blasting can cause adverse effects on groundwater flow and potentially reduce or eliminate the amount of groundwater supplied to nearby wells and/or springs.

To minimize potential effects associated with construction, Transco will implement mitigation measures during construction, including those described in the Transco Plan and the Transco Procedures, state-guidelines, and public and private well monitoring pre- and post-construction upon landowner request. For instance, waterbars will direct stormwater runoff from the construction ROW to well-vegetated areas or in accordance with state BMPs. Transco will also use sediment control measures such as filter bags, silt fences, and dewatering structures during dewatering and hydrostatic test water discharge activities. Where blasting is required, Transco will develop a site-specific blasting plan in addition to the general Blasting Plan provided in Attachment 10 of the Transco ECP (**Attachment M**) prior to blasting activities, and will conduct full-scale blast tests where recommended by Transco's Project Engineer. If any wells are affected by construction activities, Transco will repair them and/or compensate landowners for Project-related damage to wells.

Implementation of the comprehensive BMPs presented in Attachment 2 of the Transco ECP (**Attachment M**) will ensure the Project-related effects on groundwater are temporary and occur within or very near the construction ROW. Based on Transco's review, none of the Projects identified will overlap the construction ROW during the time of the Project's influence on groundwater. Therefore, the Project will not cause a significant measurable cumulative effect on

groundwater resources when considered in addition to other past, present, and reasonably foreseeable actions.

Surface water resources may be affected during various stages of construction. Clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling, could result in temporary modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, thermal effects, modification of riparian areas, and introduction of chemical contaminants such as fuel and lubricants.

The Project facilities cross or are located within two major watershed sub-regions as defined by the USGS (USGS 2013b). Transco will use watercourse crossing methods based on site-specific conditions and resource sensitivity, which include dry-ditch, trenchless, and open-cut. Transco has routed the proposed pipeline facilities to avoid and minimize effects on watercourses and bodies of water to the greatest extent practicable while maintaining engineering standards and safety. Transco completed field routing surveys within a 600-foot-wide study corridor to identify a preferred alignment that, among other factors, avoided and minimized watercourse effects. Environmental criteria used during the routing surveys specific to watercourses included: (1) crossing watercourses at 90 degree angles to minimize in-stream disturbance whenever practicable; and (2) avoiding or minimizing crossings of major watercourses and bodies of water). Construction of the Project across watercourses may result in temporary adverse effects as a result of in-stream construction activities or construction on slopes adjacent to stream channels. Clearing and grading of stream banks, blasting, in-stream trenching, trench dewatering, and backfilling could result in temporary modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, thermal effects, modification of riparian areas, and introduction of chemical contaminants such as fuel and lubricants.

Transco developed the ECP (**Attachment M**), including the Transco Procedures (Attachment 18 of the Transco ECP), in part to address temporary watercourse effects associated with construction of the Project. The Transco ECP is intended to satisfy the watercourse restoration requirements of resource protection agencies with applicable federal jurisdiction over areas

affected by the Project. Construction activities at stream crossings will also comply with any additional measures detailed in applicable federal stream crossing permits.

Drilling for natural gas reserves in Pennsylvania is currently underway in several of the counties affected by the Project. Effects from drilling activities are associated with well pad development and improvement of existing dirt and paved roads. Similarly, several gathering line and natural gas well interconnect pipeline construction Projects were recently completed or are ongoing within the same watersheds crossed by the Project in Pennsylvania. Information on the exact locations and construction schedules for these Projects was not readily available; however, based on the general location of these Projects and the ongoing nature of their development, the potential exists for cumulative effects on surface waters affected within the same watersheds crossed by the Project.

Implementation of the Transco Procedures will limit the effects of crossings in duration and distance and limit the effect of construction activities to the stream being crossed. None of the other activities identified during the cumulative effect analysis will also affect the same watercourses in the same timeframe as the Project; therefore Transco believes there will be no significant measurable cumulative effects on these resources.

Surface water withdrawals will be required for hydrostatic testing and HDD activities for the Project in Columbia County. All water withdrawals will be completed in compliance with Susquehanna River Basin Commission (SRBC) dockets. Four water withdrawal sites are planned for Columbia County: (1) Fishing Creek, (2) Fishing Creek CPLS, (3) Roaring Creek, and (4) Susquehanna River (Primary). The SRBC approved the dockets for these water withdrawal locations on September 8, 2016. The location of the water withdrawal equipment relative to wetlands, streams, floodways, and floodplains are captured in the revised Application (see **Attachment H-2**), **as well as the erosion and sediment control plans (Attachment M)**.

Water withdrawals from Fishing Creek, Fishing Creek CPLS, Roaring Creek, and Susquehanna River (Primary) will be completed in compliance with the SRBC dockets. The SRBC docket and metering plans provide details regarding the methods to be used to withdraw water. The equipment will remain in place only as long as is necessary to complete the water withdrawals. All equipment will be overland and temporary, **and no earth disturbance is anticipated with**

the installation, operation, and removal of the withdrawal equipment and piping. The intake structure and piping will be located in the floodway. The pump and other equipment will be kept out of the floodway.

No piping will be placed in existing stream culverts. Cross sections, profiles, and hydraulic analysis of piping to be placed in stream channels was completed for the SRBC docket. The information is provided in **Appendix L-4**.

To conduct the hydrostatic testing for the Project facilities, Transco will obtain applicable regulatory approvals for water withdrawals, which will be based on regulatory withdrawal rates, volumes, and passby flow restrictions, prior to commencing surface water withdrawals. Up to 61 million gallons of water is anticipated to be withdrawn from surface waterbodies within the Project area for use in hydrostatic testing. Transco will use withdrawal methods that will not reduce water flow to a point that will substantially affect base flow conditions, fish habitat and other aquatic wildlife or recreational uses. Transco will coordinate with local and state agencies, as necessary, to conduct water withdrawals in a manner that will not reduce water availability to a point that will affect public usage. Transco does not anticipate any significant water quality effects resulting from discharge of hydrostatic test water. New pipeline facilities will consist of new steel pipe, coated internally, that will be free of chemicals and lubricant, and Transco does not propose to use antifreeze or any chemical additives for drying or other purposes. Transco will consult with the PA DEP for a PAG-10 Hydrostatic Test Water Discharge Permit. In addition, Transco received water withdrawal permits on September 8, 2016 from the SRBC for Fishing Creek in Sugar Loaf Township, Roaring Creek in Franklin Township, and the Susquehanna River in Catawissa Borough and Montour Township, Columbia County. Transco also has a pending application (2016-088 and 2016-089) for a withdrawal on Fishing Creek in Hemlock Township, Columbia County. Site Plans and Cross Sections of the withdrawal locations are found in **Appendix L-4 and L-5**.

HDDs will require the use of water during operation of the drill to cool the drill head, seal the walls of the hole, and process returns. For specific watercourse crossings, where feasible and approved by the applicable regulatory agencies, Transco will draw the required water from the watercourse that is being crossed via HDD. Withdrawal locations will be selected to minimize

effects on watercourses in a similar manner as described above. Where drawing water from the watercourse is unavailable, Transco will obtain water from an approved off-site source.

The state water withdrawal permitting processes ensure that concurrent Projects involving water withdrawals from the river basins crossed by the Project do not exceed acceptable levels or result in significant cumulative effects. Based on the temporary, localized effect of drawdown due to the relatively small quantities of water required for the Project, Transco expects that the hydrostatic testing and construction dewatering activities planned for the Project will not contribute to measurable cumulative effects on these water resources.

There will be no permanent loss of wetland area from construction of the Project. The Project will have temporary effects on PEM and PSS wetlands and result in permanent conversion of PFO wetlands to PSS or PEM wetlands in proposed new permanent pipeline ROW. Transco is proposing compensatory off-site mitigation for Project-related impacts to PFO wetlands for temporal conversion of PFO wetlands within the temporary construction easement and permanent conversion of PFO wetlands to PEM wetlands within a 15-foot wide operation and maintenance corridor on either side of the pipeline centerline within the permanent easement. Off-site mitigation will also provide compensation for temporal conversion of PSS wetlands to PEM wetlands within a 10-foot wide operation and maintenance corridor centered over the pipeline within the permanent easement.

Transco has routed the proposed pipeline facilities and associated workspaces to avoid and minimize effects on wetlands while maintaining engineering standards and safety. Transco completed field routing surveys within a 600-foot wide-corridor to identify proposed pipeline alignments that, among other factors, avoided or minimized wetland effects to the extent practicable. Environmental criteria used during the routing surveys specific to wetlands included: (1) minimizing effects at wetland crossings to the maximum extent practicable; and (2) avoiding or minimizing effects on forested wetlands.

Transco will implement the measures in its Procedures to minimize effects on wetlands from Project activities during the construction, post-construction restoration, and operation phases of the Project. In addition, the Project construction activities at wetland crossings will be performed in accordance with applicable federal regulatory requirements, such as the use of specialized

construction techniques designed to minimize effects and reduce workspace area.

Implementing these measures will help to limit adverse effects on wetlands from the Project to the construction ROW in each wetland. The Transco Procedures will result in no net loss of wetlands, although there will be some conversion of wetland value and type.

Based on the above analysis, Transco believes there will be no significant measurable cumulative effects from the Project on wetlands.

Fish, Vegetation and Wildlife

This section addresses past, present, and reasonably foreseeable actions that, when taken into consideration with the Project, could result in cumulative effects on fish, vegetation and wildlife. The geographic area considered in the evaluation of potential vegetation effects included the ecosystem within 0.5 mile of the Project effect area.

The majority of effects associated with Project pipeline construction will be temporary disturbances associated primarily with clearing the construction workspace of vegetation. Temporary effects will either be short-term, where restoration to preconstruction conditions will be completed following construction, or long-term, where restoration to preconstruction conditions will take place over several growing seasons and may result in a permanent change in the vegetation structure. Long-term, temporary disturbances will be associated primarily with areas where forested land is cleared within temporary workspaces. Construction of the new aboveground facilities and expansion of some existing facilities will result in the permanent loss of vegetation communities that are cleared and replaced with impervious surfaces or converted from upland forest to open land. A summary of the temporary and permanent land that will be disturbed by the Project is provided as **Attachment J**.

Following construction, temporary workspaces on open land and agricultural land will be restored according to the Transco Plan (**Attachment M**). During operation, Transco will maintain additional 50-foot-wide permanent ROWs along CPL North and CPL South. In accordance with the Transco Plan, maintenance will include mowing the permanent ROW no more than once every 3 years. However, a 10-foot-wide corridor centered over the pipeline will be maintained annually in an herbaceous state that facilitates visual inspections. This

maintenance will result in permanent conversion of existing upland and wetland forested areas to herbaceous or scrub-shrub vegetation communities.

Transco will implement specific measures to reduce these effects, including: (1) minimizing the footprint of the proposed work activities and the duration of disturbances to the extent practicable, (2) protecting topsoil in agricultural areas and mitigating subsoil compaction, (3) adhering to the Noxious and Invasive Species Management Plan (Attachment 11 of the Transco ECP (**Attachment M**)), (4) co-locating with existing ROWs to the extent practicable, (5) installing erosion controls to prevent the loss of soils and reseeding to stabilize the soils and speed revegetation, and (6) monitoring the success of revegetation efforts and taking appropriate action to address areas that have not been fully revegetated with native seed mix.

The development Projects identified during the cumulative effects analysis are relatively small and in various stages of planning and completion. Therefore, Transco believes there will be no significant measurable cumulative effects on vegetation.

Also reviewed were past, present, and reasonably foreseeable actions that, when taken into consideration with the Project, could result in cumulative effects on wildlife, including threatened and endangered species and fisheries. The geographic area considered in the evaluation includes vegetative habitats that are used by wildlife (breeding grounds, migratory routes, range, etc.) within the Project area. These include forested areas, herbaceous habitats, wetlands, and other similar vegetative habitats used by wildlife and protected species. Potential cumulative effects resulting from construction activities and operation and maintenance have been considered as part of this analysis.

Construction of the Project facilities has the potential to negatively affect wildlife and wildlife habitat within the immediate vicinity of the pipeline route and locations of the aboveground facilities. Effects may include disturbance due to clearing and trench excavation. Transco does not expect significant direct mortality of wildlife to occur as a result of construction activities. Transco anticipates that the majority of wildlife will disperse from the vicinity of construction activities in response to disturbance from construction vehicles and equipment, but limited mortality of slow-moving or sessile organisms could occur within the footprint of the aboveground facilities, partly as a result of construction vehicle traffic. Noise and ground

disturbance generated by pipeline construction activities may temporarily affect wildlife behavior in the immediate vicinity of the facilities.

Following construction activities, the existing ROWs will be restored to preconstruction conditions to the extent practicable, and it is expected that wildlife will quickly return to the vicinity of the ROWs, using them as corridors for travel, refuge, foraging, and nesting. Following construction, these ROWs will be maintained in a manner similar to current conditions. Transco will also restore temporary workspaces outside agricultural areas using an herbaceous seed mix that will minimize competition with native woody plant species while offering additional wildlife habitat and food sources, or another type of seed mix agreed upon with the applicable agencies and the landowner. Habitat fragmentation and conversion of forested lands will occur as a result of this Project and the other Projects that involve clearing of forested land during construction and/or operation. However, Transco has sought to avoid and minimize forest clearing, to the extent practicable, through co-location with other utility corridors and long-term maintenance of ROW widths in forested wetlands. Restoration of vegetation in Project construction areas will be ensured by adherence to the Transco Plan and Procedures (Attachments 17 and 18 of the Transco ECP (**Attachment M**)), and other applicable federal permit conditions.

Other than the occasional presence of vehicles during inspections and maintenance, Transco does not anticipate any other disturbance to wildlife along the pipeline ROWs during operation. Similarly, operation of the aboveground facilities is not expected to adversely affect wildlife populations.

Because the pipeline ROW will be revegetated and useable by wildlife following construction, and important habitats have been avoided to the greatest extent practicable, long-term effects on wildlife habitats will be minimized and avoided. Transco expects that similar restoration activities would be employed for the Projects identified in the cumulative effects analysis as well, along with the implementation of BMPs and other effect avoidance measures. Based on this, Transco believes there will be no significant measurable cumulative effects of the Project on wildlife.

Transco completed surveys for threatened and endangered species through the Project area and developed suitable avoidance, minimization, and mitigation measures to prevent adverse

effects. Transco believes that through these agency consultations cumulative effects have been appropriately addressed.

Transco consulted with the PFBC to identify both game and non-game fishery species and determine fishery classifications for watercourses crossed by the proposed pipeline. Due to the Project route and location and the presence of downstream dams, Transco determined that consultation with NOAA Fisheries was not necessary for the Project.

Construction of the Project may include temporary effects on watercourses and associated fisheries crossed by the Project. Temporary effects on fisheries include disturbance of watercourse banks, removal of bank vegetation, and in some instances, modification of flow during dry-crossing construction. Transco will minimize effects resulting from construction through adherence to the Transco Procedures in the ECP (**Attachment M**). Transco is also consulting with the PFBC on these and other fishery effect minimization and mitigation measures. No watercourses or fishery resources will be affected by construction of new and modified existing aboveground facilities. Transco does not anticipate that the operation and maintenance of the pipeline or aboveground facilities will have adverse effects on fishery resources.

The Project effect on fisheries will be similar to that described for surface waters. Implementation of the Transco Procedures will limit the effects of crossings in duration and distance and limit the effect of construction activities to the stream, and fishery, being crossed. None of the other activities identified in the cumulative effects analysis will also affect the same streams or fisheries within the same timeframe as the Project; therefore, there is no potential for cumulative effect on these fisheries.

Cultural Resources

Transco has consulted with the PHMC and applicable Tribal Historic Preservation Offices regarding potential effects on cultural resources resulting from the Project. Beginning in May 2014, Transco commenced with Phase I cultural resources surveys in Pennsylvania. Survey in Pennsylvania will continue in 2015, and continued surveys into 2016 in Pennsylvania. Transco completed surveys for cultural resources through ~~the majority of~~ the Project area and developed suitable avoidance, minimization, and mitigation measures to prevent adverse effects

(see **Attachment D-1 and D-2**). Use of avoidance and mitigation measures would be expected to prevent adverse effects. Transco believes that through these agency consultations cumulative effects have been appropriately addressed.

Land Use, Recreation and Aesthetics

The geographic area considered in the evaluation of land use includes the community, metropolitan area, county, state, or region within the Project effect area. For recreation, the geographic area considered in this analysis includes rivers, lakes, geographic areas, or land management units within the Project effect area. For visual resources, the geographic area would be the viewshed within 0.5 mile of the Project study area. Potential cumulative effects resulting from construction activities and operations and maintenance have been considered as part of this analysis.

The primary pipeline-related effects on existing land uses for the Project will be associated with vegetation clearing during construction. Agricultural lands crossed by the Project include large tracts of row and field crops such as corn, soybeans, wheat, and hay. No commercial silviculture (i.e., timber production) operations have been identified along the pipeline route. A majority of the commercial and industrial land crossed by the Project is not currently in use and is located within contractor/pipe yards. Open land (e.g., nonforested and undeveloped land not classified for another use, including land maintained as utility ROWs) is also crossed by the Project.

Transco will allow forested areas affected within the temporary construction ROWs and other temporary workspaces to revert to forest through natural successional processes after construction. Within the permanent ROW, Transco will maintain currently forested upland areas in an herbaceous vegetation state to facilitate inspection and operation of the Project facilities.

Transco will acquire road and railroad crossing permits from the appropriate state or local jurisdiction, as required by state and/or local road encroachment permits and regulations. By complying with these permits, Transco will not permanently affect any roads or railroads. Transco proposes to construct its pipeline facilities within or adjacent to existing utility corridors where practicable. Where co-located with existing corridors, Transco will seek to overlap the construction ROWs with existing utility ROWs to minimize new disturbance.

Transco identified public land, conservation land, recreational areas, and other designated or special use areas in the vicinity of the Project and obtained additional information for these areas by consulting with federal, state, county, and local agencies and private landowners; reviewing aerial photographs and maps of the Project area; and through field surveys conducted in 2014 through 2016. Transco has coordinated with appropriate federal, state, and municipal agencies on proposed crossings on public lands to minimize effects on recreation.

Land use effects resulting from transportation and residential/commercial developments in the vicinity of the Project are expected to be minimal due to the scope and nature of the work (as in the case of the transportation Projects) or because of the minimal or lack of activity (as in the residential/commercial developments). Land use effects associated with other natural gas pipelines would be similar to those for the Project, with similar mitigation measures and effect avoidance measures being implemented. Based on the above analysis, Transco believes there will be no significant measurable cumulative effects of the Project on land use.

Visual effects associated with construction activities will result from the removal of vegetation, particularly in forested areas. These effects will be observed where the pipeline parallels or crosses roads and where vegetation is removed between the ROWs and residences. Potential mitigation measures may include planting visual screens along roadways and in residential areas in coordination with regulatory agencies, as necessary. While temporary visual effects on the landscape will occur during Project construction due to clearing, grading, and construction activities, Transco will restore disturbed areas in accordance with the Transco Plan and Transco Procedures (Attachments 17 and 18 of the Transco ECP (**Attachment M**)).

In summary, Transco believes there will be no significant measurable cumulative effects of the Project on land use, recreation, or visual resources.

E. Other Impacts to Water Resources Required to fulfill the Purposes of the Project

As described in **Attachment J – Project Description**, the Atlantic Sunrise Project involves water obstructions and encroachments in 10 counties: Clinton, Lycoming, Susquehanna, Wyoming, Luzerne, Columbia, Northumberland, Schuylkill, Lebanon and Lancaster counties. **This permit application package identifies the water obstructions and encroachments required in-for the entirety of the Project workspaces located within Columbia County-on parcels that are**

accessible to date. Transco is submitting separate applications that will identify the water obstructions and encroachments in the other counties, as applicable.

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Transcontinental Gas Pipe Line Company, LLC
Columbia County*

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