

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

**ATTACHMENT L -5
ENVIRONMENTAL ASSESSMENT ENCLOSURE D**

Revised July 2017

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 **Susquehanna 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 **within 100 percent of the Project area in Susquehanna County**.

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

No Project-related impacts to National, State or Local Park, Forest or Recreation Areas are expected to occur within Susquehanna County.

A2. Natural, Wild, or Wilderness Area

No wild or wilderness areas are crossed by the Project.

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 Susquehanna County.

A5. National Wildlife Refuge

There will be no impacts to national wildlife refuges as a result of the portion of the Project within Susquehanna 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, a process already 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 Susquehanna County at the Mount View School District on June 2, 2014. This open house did not result in any public comments regarding cultural resources associated with the Project in Susquehanna County.

The Phase I archaeological field reconnaissance of the CPL-North study corridor in Susquehanna County resulted in the identification of four small/ephemeral archaeological resources, subsequently inventoried with the PHMC as site 36SQ0189 and isolated finds

36SQ/023, 36SQ/024, and 36SQ/027. All four of these resources were recommended as Not Eligible for the National Register of Historic Places (NRHP), and PHMC review of each confirmed that no additional fieldwork would be required at these four locations prior to construction of the Project.

A total of 18 aboveground resources were identified during the Architectural History survey conducted for Project land requirements in Susquehanna County; 15 of these resources are currently located within the Project, while an additional three resources were identified on parcels subsequently removed from the Project APE (due primarily to changes in the Project alignment). One of the 15 resources was recommended as Potentially Eligible for the NRHP, and the PHMC noted that the eligibility was undetermined at this time. PHMC also determined that seven of the 15 resources were Not Eligible. No anticipated effects were determined for the remaining seven resources as a result of the Project.

A7. State Game Lands

There will be no anticipated Project-related impacts to state game lands within Susquehanna County.

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

There will be no anticipated Project-related impacts to federal, state, local or private plant or wildlife sanctuaries within Susquehanna 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.

The Project will cross approximately 4.4 miles of prime farmland or farmlands of statewide importance in Susquehanna County. Pipeline construction may result in temporarily removing those 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 after construction. Effects on agricultural soils, including prime and important farmland soils, will be mitigated according to the Transco Agricultural Plan and the Transco Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (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 due to construction activities, those effects can be mitigated through the restoration measures previously discussed, compensation for crop loss and by resumption of proper soil management by landowners.

Construction of the contractor/pipe yards and contractor staging areas will temporarily affect prime and important farmland soils. Pipeline operation will not adversely affect agricultural soils, including prime farmland and farmland of statewide importance.

Construction of the Zick Meter Station will permanently affect approximately 4.0 acres of prime farmland and soils of statewide importance by converting them to nonagricultural land uses. The permanent loss of designated prime farmlands and farmlands of statewide importance at aboveground facilities will not be mitigated.

Transco conducted title searches to identify all easements crossed by the Project. The title search identified one parcel crossed by the Project in Susquehanna County with an agricultural easement. The Project in Susquehanna County crosses an Agricultural Security Areas (ASA) agricultural conservation easement (Tract PA-SU-040-B.000).

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.

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.

Transco will restore agricultural properties with conservation easements in accordance with the methods described 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 Susquehanna 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 13 streams, 14 floodways, and 17 wetlands within Susquehanna 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 Environmental Construction Plan (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 Susquehanna County provided within 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 Project-specific Wetland and Waterbody Construction and Mitigation Procedures (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). **Appendix P-1, Attachment P includes a description of the LOD for each wetland and watercourse impact proposed for the Project within Susquehanna 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 Susquehanna 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 presented within Table L(d)-1. Transco's construction contractor will be required to demonstrate that blasting is necessary 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.

**Table L(d)-1
 Watercourses with Shallow Depth to Bedrock Crossed by the Atlantic Sunrise Project in Susquehanna 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-T12-21007A	UNT to Millard Creek	55.11	41.69056	-75.72030	Lenox	Ephemeral	10.12	CWF, MF	Wild Trout Waters	II
WW-T92-21002	UNT to Tower Branch	MOC-0061 0.07	41.69581	-75.71783	Lenox	Ephemeral	18.46	CWF, MF	Wild Trout Waters	II
WW-T12-21007	UNT to Millard Creek	55.10	41.69051	-75.72051	Lenox	Intermittent	11.36	CWF, MF	Wild Trout Waters	II
WW-T12-21009A	UNT to Tower Branch	MOC-0061 0.09	41.69599	-75.71742	Lenox	Perennial	11.50	CWF, MF	Wild Trout Waters	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 the 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 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 allopathic 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. Seed mixes for the Project are included in the **Riparian Area Impact Assessment and Restoration Plan for Susquehanna 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 the 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) 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 in accordance with the **Riparian Area Impact Assessment and Restoration Plan for Susquehanna County within 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 will be reseeded with approved seed mixes in accordance with the Transco Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (Transco Plan), the Transco Procedures (Attachments 17 and 18 of the Transco ECP (**Attachment M**)), and **the Riparian Area Impact Assessment and Restoration Plan for Susquehanna 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 2.1211 acres of temporary wetland impacts to PEM wetlands, 0.0992 acres of temporary impacts to PSS wetlands, 0.2529 acres of PFO wetlands, and 0.3251-acre of 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 0.3363 acres of permanent impacts to PEM wetlands, 0.0156 acres of permanent impacts to PSS wetlands, and 0.1707 acres of PFO wetlands. There will be no permanent 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 are 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)-2 details the anticipated impacts to wetlands as a result of the Project.

**Table L(d)-2
 Wetland Impacts Associated with the Atlantic Sunrise Project in Susquehanna County**

Resource Name	Chapter 105.17 Wetland Classification	Wetland Cowardin Classification	Temporary Impact area^a (acres)	Permanent Impact area (acres)	Latitude	Longitude
W-T30-21002	Other	PEM	0.0477	0.0110	41.65559	-75.76041
W-T12-21001A	Other	PEM	0.6798	0.1093	41.66172	-75.5035
W-T70-21001A-1 / W-T70-21001A-2	Other	PEM	0.0756	0.0185	41.66932	-75.74492
W-T51-21004 / W-T51-21004-1	Other	PEM	0.1454	0.0231	41.67439	-75.74348
W-T64-21001-1	Other	PEM	0.0703	0.0162	41.67918	-75.73889
W-T12-21007A	EV	PEM	0.1281	0.0184	41.68499	-75.73081
W-T12-21008-1	EV	PEM	0.0347	0.0076	41.69058	-75.72057
W-T12-21009A / W-T12-21009A-1 / W-T12-21009A-2	EV	PEM	0.3125	0.0492	41.69436	-75.71981
W-T48-21002A	Other	PEM	0.3149	0.0447	41.70329	-75.71514
W-T48-21001	EV	PEM	0.2116	0.0185	41.70966	-75.70737
W-T48-21003	EV	PEM	0.1005	0.0198	41.71044	-75.70770
Total PEM Wetland Impacts			2.1211	0.3363		
W-T12-21009B	EV	PSS	0.0992	0.0156	41.69568	-75.71815
Total PSS Wetland Impacts			0.0992	0.0156		
W-T50-21002	EV	PFO	0.0008	0.0058	41.68178	-75.73294
W-T50-21003	EV	PFO	0.0130	0.0052	41.68193	-75.73286
W-T12-21009C	EV	PFO	0.1547	0.1023	41.69578	-75.71794
W-T48-21002C	Other	PFO	0.0844	0.0574	41.70278	-75.71496
Total PFO Impacts			0.2529	0.1707		
WB-T87-21001	Other	PUB	0.3251	0.0000	41.71579	-75.70880
Total PUB Impacts			0.3251	0.0000		

**Table L(d)-2
 Wetland Impacts Associated with the Atlantic Sunrise Project in Susquehanna County**

Resource Name	Chapter 105.17 Wetland Classification	Wetland Cowardin Classification	Temporary Impact area^a (acres)	Permanent Impact area (acres)	Latitude	Longitude
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 Scrub Shrub PFO = Palustrine Forested EV = Exceptional Value a: 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.						

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 0.28 acre of impacts to EV PFO wetlands, 0.14 acre of impacts to non-EV PFO wetlands, and 0.02 acre of permanent impacts to EV PSS wetlands in Susquehanna County. No non-EV PSS wetlands are anticipated to be impacted in Susquehanna County. Mitigation will be required for 0.44 acre of wetland impacts within Susquehanna County which will be mitigated for at the Towanda Creek-Permittee-Responsible Mitigation (PRM) site in Bradford County as detailed in **Attachments Q-1 and Q-2**. Transco proposes to provide offsite mitigation for $[0.28 \text{ acre} * 2.5 \text{ ratio} = 0.70 \text{ acre}] + [(0.14 \text{ acre} * 2.0 \text{ ratio} = 0.28 \text{ acre}) + (0.02 \text{ acre} * 1.75 \text{ ratio} = 0.04 \text{ acre}) = 1.02 \text{ acre}]$. 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.

Transco has provided a Mitigation Master Plan and a Site Specific Mitigation Plan for the Towanda PRM site in Bradford County. Under the authorization of this Chapter 105 permit

application, Transco is seeking authorization to construct the Mitigation Site for this Project. Total mitigation needed has been adjusted to account for 0.01-acre of proposed permanent impact to PEM Wetland W-2 within the Saddle Swamp easement area as a result of proposed upgrades/improvements to a permanent agricultural crossing at the PRM site.

The USACE Highway Methodology Workbook Supplement: Wetland Functions and Values (Supplement 1993) was used to evaluate the functions and values of the wetlands at the impact site and the PRM Sites. The Supplement is a qualitative approach to describing the physical characteristics of and identifying the functions and values exhibited by a wetland.

The Wetland Function-Value Evaluation Form in the Supplement was completed at the PRM Sites in order to capture the existing or pre-restoration conditions at the PRM Sites as well as the anticipated ecological lift the site will experience as a result of the restoration activities. The baseline conditions of the existing wetlands at the PRM Sites already represent a functional uplift with respect to the functions and values as compared to the impacted wetlands for which the PRM Sites will be providing mitigation. The functional uplift will further be improved through the proposed restoration efforts. The wetland functions and values assessments performed at the Project impact locations and the PRM Sites indicate that the mitigation site, once restored, will compensate for 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 (see **Attachment Q-1**).

Currently, the existing condition of the land within the proposed Towanda Creek PRM Site exists in a degraded state. Environmental resources including wetlands and waters within the PRM Site are currently surrounded by active agricultural land and continue to be degraded by the surrounding landscape uses. Over time, agricultural practices have filled in and disconnected hydrology to historic headwater wetland areas. Existing vegetation includes non-native Eurasian pasture grasses and invasive multiflora rose (*Rosa multiflora*). Based on the USACE Supplement methodology for identifying wetland functions and values, the wetland within the PRM Site are currently collectively suitable for eight functions and values (**Attachment Q-2**, Appendix F: Wetland Functions and Values

Assessment Forms). Given the current degraded state of the aquatic resources on-site, only four of the eight collective suitable functions and values (including groundwater recharge/discharge, flood flow alteration, sediment/toxicant retention, and wildlife habitat) are considered principal functions across the larger system.

Post restoration, it is anticipated that the wetlands within the PRM Site will be collectively suitable for nine functions and values, of which six will be performing at principal levels (these include the four that were assessed as being principal prior to restoration activities, in addition to nutrient removal and sediment/shoreline stabilization). As such, the PRM Site will exhibit an ecological uplift that will not only enhance the existing principal functions and values, but will also provide additional principal functions and values. Ecological functionality is therefore expected to improve considerably as a result of the proposed restoration efforts.

Farming activities such as yearly discing and associated soil erosion have caused soil to slump off of steeper convex hill slope areas into the toe of slope concave areas where the eroded sediment has settled out. Grading in the proposed wetland re-establishment areas will remove this accumulated soil from the relatively flat valley bottom back towards the concave toe of slopes, re-establishing grades consistent with the grades of the existing wetland resources. This should ensure that the re-established headwaters' depressional wetlands have adequate hydrology while also optimizing storm water infiltration and storage in this headwaters system, improving the groundwater recharge/discharge and floodflow alteration functions. Over time as the re-established wetlands mature into a forested state, they will restore additional sediment/toxicant retention, nutrient removal, and sediment stabilization functionality to the system. The on-site stream will be planted with live stakes to provide stream bank stabilization and vegetative enhancement, further improving sediment/toxicant removal and sediment stabilization function to on-site aquatic resources as the live stakes develop into mature trees.

Removing invasive and non-native vegetation and re-planting the PRM Site with a native-community will increase the vegetative diversity and density of the PRM Site, enhancing the quality and quantity of wildlife habitat available within the PRM Site. Native plantings proposed across the entire PRM Site will improve the effectiveness of the wetlands and reduce flood damage by improving water retention for prolonged periods following

precipitation events and gradually releasing floodwaters. Increased vegetative diversity, and density will facilitate the retention of greater volumes of water, sediment, nutrients and pathogens than under normal or average rainfall conditions, supporting additional stability and buffering capacity of the wetland ecological system. Post restoration, the PRM Site wetlands will be significantly more effective in nutrient removal/ retention/ transformation as they will be better able to trap nutrients from surface runoff and process them into other forms or trophic levels. Enhancement plantings will include larger trees and shrubs, which will more effectively withstand larger flood events and erosive stresses. The post-restoration wetland system will exhibit a diverse plant community structure and will offer a greater and wider range of usable products for wildlife, improving production export functionality. Although the PRM Site is located on private land and will not likely be accessible to the public, Towanda Creek is classified as a trout-stocked migratory fishery, with a portion of the creek upstream of the PRM Site designated as approved trout waters. The PRM Site therefore plays an important role in the greater ecological system and watershed.

Watercourses and Bodies of Water

Thirteen watercourses will be crossed during construction of the pipeline in Susquehanna 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 0.2926 acres of perennial streams, and approximately 0.0552 acres 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 0.0403 acres of perennial streams and 0.0076 acres of intermittent and ephemeral streams. Transco is proposing to cross all watercourses of the Project using the dam-and-pump construction crossing 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)-3.

**Table L(d)-3
 Stream Impacts Associated with the Atlantic Sunrise Project in Susquehanna 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-T30-21001	UNT to Willow Brook	CWF, MF	Perennial	Wild Trout Waters	70.20	17.25	0.0358	10.00	17.25	0.0040	41.65399	-75.76159	Dam-and-Pump
WW-T12-21004	UNT to Willow Brook	CWF, MF	Perennial	Wild Trout Waters	72.44	37.30	0.0494	10.82	37.30	0.0085	41.65799	-75.75859	Dam-and-Pump
WW-T12-21001	Willow Brook	CWF, MF	Perennial	Wild Trout Waters	76.78	34.75	0.0607	11.18	34.75	0.0080	41.66190	-75.74886	Dam-and-Pump
WW-T50-21001	Utley Brook	CWF, MF	Perennial	Wild Trout Waters	75.63	26.73	0.0414	10.05	26.73	0.0061	41.67527	-75.74235	Dam-and-Pump
WW-T50-21002	Millard Creek	CWF, MF	Perennial	Wild Trout Waters	73.57	26.87	0.0492	10.51	26.87	0.0062	41.68174	-75.73312	Dam-and-Pump
WW-T12-21009A	UNT to Tower Branch	CWF, MF	Perennial	Wild Trout Waters	74.70	15.00	0.0219	11.50	15.00	0.0034	41.69599	-75.71742	Dam-and-Pump
WW-T48-21001	Tower Branch	CWF, MF	Perennial	Wild Trout Waters	68.34	17.96	0.0342	10.00	17.96	0.0041	41.71033	-75.70767	Dam-and-Pump
Perennial Stream Impacts							0.2926			0.0403			
WW-T50-21003	UNT to Millard Creek	CWF, MF	Intermittent	Wild Trout Waters	69.94	7.57	0.0103	10.82	7.57	0.0017	41.68188	-75.73285	Dam-and-Pump
WW-T12-21007A	UNT to Millard Creek	CWF, MF	Ephemeral	Wild Trout Waters	52.44	5.04	0.0062	10.12	5.04	0.0012	41.69056	-75.72030	Dam-and-Pump
WW-T92-21002	UNT to Tower Branch	CWF, MF	Ephemeral	Wild Trout Waters	53.01	15.27	0.0067	18.46	3.63	0.0017	41.69581	-75.71783	Dam-and-Pump
WW-T17-21001	UNT to Tower Branch	CWF, MF	Ephemeral	Wild Trout Waters	83.80	7.38	0.0116	10.22	7.38	0.0017	41.71500	-75.70916	Dam-and-Pump
WW-T12-21004A	UNT to Willow Brook	CWF, MF	Intermittent	Wild Trout Waters	103.88	15.30	0.0106	0.00	0.00	0.0000	41.65790	-75.75878	N/A
WW-T12-21007	UNT to Millard Creek	CWF, MF	Intermittent	Wild Trout Waters	86.82	5.32	0.0098	11.36	5.32	0.0013	41.69051	-75.72051	Dam-and-Pump
Ephemeral and Intermittent Stream Impacts							0.0552			0.0076			
Source: http://www.pacode.com/secure/data/025/chapter93/chap93toc.html http://www.fishandboat.com/waters_trout.htm a: CWF = Cold Water Fishery; MF = Migratory Fishes. 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.													

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 Method

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.

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 wild trout waters, no in-stream work will occur from October 1 through December 31. 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 use 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 in accordance with the **Riparian Area Impact Assessment and Restoration Plan for Susquehanna County within 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 Susquehanna 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

Willow Brook, Tower Branch, UNT to Tower Branch, and Millard 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 1.7270 acres. Of the total temporary impacts, 0.2016 will be to FEMA mapped floodplains. Permanent floodway impacts will be 0.1991 acres as a result of operation of the pipeline ROW. Of the total permanent impacts, 0.0286 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)-4. As stated above, A Riparian Area Impact Assessment and Restoration Plan for Susquehanna County is provided in **Appendix L-2**. The Riparian Area Impact Assessment and Restoration Plan for Susquehanna County includes measures for replanting and reestablishing the riparian buffer within the regulated floodplain (Federal Emergency Management Agency [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)-4
 Floodplain Impacts Associated With the Atlantic Sunrise Project in Susquehanna County**

Resource ID	Resource Name	Floodway Type	Temporary Impact Dimensions ₄ (Length x Width)		Temporary Impact area ^c (Acres)	Permanent Impact Dimensions ₄ (Length x Width)		Permanent Impact area (Acres)	Latitude	Longitude
			(Feet) ^a	(Feet) ^a		(Feet) ^a	(Feet) ^a			
Floodway to WW-T12-21001	Floodway to Willow Brook	FEMA Detailed	80.80	79.85	0.0193	69.67	10.00	0.0041	41.66190	-75.74886
Floodway to WW-T12-21004	Floodway to UNT to Willow Brook	Assumed 50 Feet ^b	232.28	137.80	0.2969	198.21	35.91	0.0376	41.65799	-75.75859
Floodway to WW-T12-21006	Floodway to UNT to Millard Creek	Assumed 50 Feet	168.06	25.00	0.0583	60.64	8.27	0.0074	41.68461	-75.73085
Floodway to WW-T12-21007	Floodway to UNT to Millard Creek	Assumed 50 Feet ^b	184.32	107.99	0.2627	179.80	17.34	0.0312	41.69051	-75.72051
Floodway to WW-T12-21008	Floodway to UNT to Tower Branch	Assumed 50 Feet	208.75	46.46	0.0521	56.47	8.63	0.0055	41.69524	-75.71896
Floodway to WW-T12-21009A	Floodway to UNT to Tower Branch	FEMA Detailed	95.31	25.73	0.0079	34.05	10.00	0.0015	41.69599	-75.71742
Floodway to WW-T17-21001	Floodway to UNT to Tower Branch	Assumed 50 Feet	383.31	172.96	0.2813	117.96	13.92	0.0245	41.71500	-75.70916
Floodway to WW-T30-21001	Floodway to UNT to Willow Brook	Assumed 50 Feet	150.67	90.00	0.1781	119.91	10.00	0.0232	41.65399	-75.76159
Floodway to WW-T48-21001	Floodway to Tower Branch	FEMA Detailed	173.58	69.12	0.0301	117.81	10.00	0.0029	41.71033	-75.70767
Floodway to WW-T48-21001A	Floodway to UNT to Tower Branch	Assumed 50 Feet	117.63	43.30 43.40	0.0395	25.05	10.00	0.0044	41.70986	-75.70735
Floodway to WW-T50-21001	Floodway to Utley Brook	Assumed 50 Feet ^b	171.80	90.00	0.1991	130.55	10.00	0.0232	41.67527	-75.74235
Floodway to WW-T50-21002	Floodway to Millard Creek	FEMA Detailed ^b	144.27	90.00	0.1442	130.12	10.00	0.0201	41.68174	-75.73312
Floodway to WW-T92-21002	Floodway to UNT to Tower Branch	Assumed 50 Feet ^b	123.61	51.67	0.0847	65.96	10.00	0.0135	41.69581	-75.71783
Floodway to WW-T65-21001	Floodway to UNT to Millard Creek	Assumed 50 Feet	153.94 140.00	65.84 41.73	0.0728	0.00	0.00	0.0000	41.64487	-75.76466
Floodway Impacts					1.7270			0.1991		

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: See Attachment E-2 footnotes for a description of temporary impacts in the floodway associated with access roads.

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 Project construction outside of the restricted October 1 through December 31 time period for Wild Trout streams. There are no Class A Wild Trout streams crossed by the Project within Susquehanna County. Transco has 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 **Susquehanna County**.

B1d2. Refuges

The Project will not affect refuges in **Susquehanna 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. 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 Northeastern Regional Office regarding surface water intakes. The PA DEP Northeastern Regional Office 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 (Ostir 2014).

Based on the available information utilized in the above-referenced desktop analysis, Transco has determined there are no public water supplies within the vicinity of the Project within Susquehanna County; therefore, no impacts are anticipated. Transco will mitigate the potential for impact to distal public water supplies through use of dry-ditch crossing methods and implementation of erosion and sediment control plans as specified in the Transco Procedures.

During construction, Transco will adhere to all measures in the Transco Procedures (ECP Attachment 18, provided within **Attachment M** of this Application), 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. Per the Transco Spill Plan, 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 waterway, thereby preventing contamination of 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 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 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 Susquehanna 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 **Susquehanna 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 compensatory 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 **Susquehanna County**.

B4d and e. Hiking and Observation (wildlife)

There are no Project-related impacts expected to occur to hiking and wildlife observation, as no national, local, or state parks or recreation areas are crossed.

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 Susquehanna County, no impacts to recreationally navigable waters are expected and PFBC determined that no ATON plans are required.

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 Section 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 2013): 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 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 waterbodies 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.

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 watercourses within the Project area for use in hydrostatic testing. **No water withdrawal sites are anticipated in Susquehanna County.** 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 and the Susquehanna River Basin Commission regarding hydrostatic test water withdrawal and discharge permits within the jurisdictional areas of each agency. Transco will continue to update FERC on the progress of agency consultation and permit applications.

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 or body of water that is being crossed via HDD. Withdrawal locations will be selected to minimize effects on watercourses in a similar manner as described above. **As stated previously, no water withdrawal sites are anticipated in Susquehanna County.** Where drawing water from the watercourse or body of water 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. 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 a 50-foot-wide permanent ROWs along the CPL North 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 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 all the water obstructions and encroachments required in Susquehanna County.** Transco is submitting separate applications that will identify the water obstructions and encroachments in the other counties, as applicable.

F. References

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