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Office of
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Transcontinental Gas Pipe Line Company, LLC

Docket No. CP18-186-000

Southeastern Trail Project

Environmental Assessment

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 2
Transcontinental Gas Pipe Line
Company, LLC
Southeastern Trail Project
Docket No. CP18-186-000

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Southeastern Trail Project, proposed by Transcontinental Gas Pipe Line Company, LLC (Transco) in the above-referenced docket. Transco requests authorization to construct and operate about 7.7 miles of new natural gas pipeline located along the existing Transco Mainline, modify three existing compressor stations in Virginia, and modify 21 existing facilities in South Carolina, Georgia, and Louisiana.

The EA assesses the potential environmental effects of the construction and operation of the Southeastern Trail Project in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed Project, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The specific facilities proposed as part of the Southeastern Trail Project include:

- Manassas Loop in Fauquier and Prince William Counties, Virginia: construction of approximately 7.7 miles of new 42-inch-diameter pipeline loop¹, co-located along the Transco Mainline from milepost 1568.13 to 1575.85;
- Compressor Station 185 in Prince William County, Virginia: uprating the existing electric-driven compression unit driver from 25,000 to 30,000 horsepower (HP);
- Compressor Station 175 in Fluvanna County, Virginia: installing one new 22,490 HP turbine-driven compression unit, uprating the existing electric-driven compression unit driver from 33,000- to 41,250 HP;
- Compressor Station 165 in Pittsylvania County, Virginia: installing two new 22,490 HP turbine-driven compression units and abandoning 10 compressor units (totaling 20,000 HP) and related equipment;

¹ A pipeline loop is a segment of pipe constructed parallel to an existing pipeline to increase capacity.

- flow reversal modifications and/or deodorization modifications at:
 - Compressor Station 65 in St. Helena Parish, Louisiana;
 - Compressor Station 115 in Coweta County, Georgia;
 - Compressor Station 116 in Carroll County, Georgia;
 - Compressor Station 120 in Henry County, Georgia;
 - Compressor Station 125 in Walton County, Georgia;
 - Compressor Station 130 in Madison County, Georgia;
 - Compressor Station 135 in Anderson County, South Carolina;
 - Compressor Station 140 in Spartanburg County, South Carolina; and

- installation of deodorization facilities at 13 existing mainline valve facilities in South Carolina and Georgia along the Transco Mainline.

The Commission mailed a copy of the *Notice of Availability* to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the Project area. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the Environmental Documents page (<https://www.ferc.gov/industries/gas/enviro/eis.asp>). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (<https://www.ferc.gov/docs-filing/elibrary.asp>), click on General Search, and enter the docket number in the "Docket Number" field, excluding the last three digits (i.e. CP18-186). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on this Project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **March 11, 2019**.

For your convenience, there are three methods you can use to file your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

- (1) You can file your comments electronically using the [eComment](#) feature on the Commission's website (www.ferc.gov) under the link to [Documents and Filings](#). This is an easy method for submitting brief, text-only comments on a project;

- (2) You can also file your comments electronically using the [eFiling](#) feature on the Commission's website (www.ferc.gov) under the link to [Documents and Filings](#). With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "[eRegister](#)." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or
- (3) You can file a paper copy of your comments by mailing them to the following address. Be sure to reference the Project docket number (CP18-186-000) with your submission: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214). Motions to intervene are more fully described at <http://www.ferc.gov/resources/guides/how-to/intervene.asp>. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. The Commission may grant affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the Project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the [eLibrary](#) link. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

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TECHNICAL ACRONYMS

ATWS	additional temporary workspaces
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
dB	decibels
dBA	A-weighted decibels
E&SC Plan	Erosion and Sediment Control Plan
EA	environmental assessment
EDR	Environmental Data Resources, Inc.
EI	environmental inspector
EPA	U.S. Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
HCA	high consequence areas
HP	horsepower
ISO	International Organization for Standardization
L _{dn}	day-night sound level
L _{eq}	equivalent sound level
MLV	mainline valve
MBTA	Migratory Bird Treaty Act
Memorandum	Memorandum of Understanding on Natural Gas Transportation Facilities
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NO _x	nitrogen oxides
NOI	<i>Notice of Intent to Prepare an Environmental Assessment for the Southeastern Trail Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Sessions</i>
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OEP	Office of Energy Projects
Order	Commission's Order
PEM	palustrine emergent
PERT	Program Evaluation Review Technique
PFO	palustrine forested
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	<i>The Commission's Upland Erosion Control, Revegetation, and Maintenance Plan</i>
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to 10 microns
PM _{2.5}	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns

Procedures	The Commission's <i>Wetland and Waterbody Construction and Mitigation Procedures</i>
Project	Southeastern Trail Project
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
TAR	Temporary Access Road
Transco	Transcontinental Gas Pipe Line Company, LLC
USACE	United States Army Corps of Engineers
USC	U.S. Code
USDOT	U.S. Department of Transportation
USGS	U.S. Geological Survey
VDEQ	Virginia Department of Environmental Quality
VDOT	Virginia Department of Transportation
VDGMR	Virginia Division of Geology and Mineral Resources
VOC	volatile organic compounds

A. PROPOSED ACTION

1.0 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental effects of the natural gas facilities proposed by Transcontinental Gas Pipe Line Company, LLC (Transco). We¹ prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), Title 40 of the Code of Federal Regulations (CFR), Parts 1500–1508 (40 CFR 1500–1508), and FERC implementing regulations at 18 CFR Part 380.

On April 11, 2018, Transco filed an application for a Certificate of Public Convenience and Necessity (Certificate) and an authorization in Docket No. CP18-186-000 under Section 7(b) and (c) of the Natural Gas Act (NGA) and Part 157 of the Commission’s regulations. Transco proposes to construct and operate a new natural gas pipeline loop² in Virginia, modify existing aboveground facilities in Virginia, South Carolina, Georgia, and Louisiana, and retire and remove compressor units in Virginia. Transco’s project is referred to as the Southeastern Trail Project (Project).

Our EA is an integral part of the Commission’s decision on whether to issue Transco a Certificate to construct, own, and operate the proposed facilities, and an authorization to abandon facilities. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize Project-related environmental impacts; and
- facilitate public involvement in the environmental review process.

2.0 PURPOSE AND NEED

Transco’s application states that the purpose of the Project is to provide an additional 296.375 Mdt/d (thousand dekatherms per day) of additional firm transportation capacity path from the existing bidirectional Zone 5 Pleasant Valley Interconnect between Transco and the Dominion Energy Cove Point Pipeline in Fairfax County, Virginia to the existing Zone 3 pooling point at Compressor Station 65 in St. Helena Parish, Louisiana. Transco has executed long-term binding precedent agreements with five natural gas shippers for 100 percent of the firm transportation capacity.³ Transco intends to serve the shippers’ incremental natural gas supply needs beginning with the 2020/2021 winter heating season.

Under section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project. Section 7(b) of the NGA specifies that no natural gas company shall abandon any portion of its facilities subject to the Commission’s jurisdiction without the Commission

¹ “We,” “us,” and “our” refer to environmental staff of the Office of Energy Projects (OEP).

² A loop is a pipeline that is constructed adjacent to another pipeline, typically in the same right-of-way, for the purpose of increasing capacity in this portion of the system.

³ Project shippers are Virginia Natural Gas, Inc., City of Buford, Georgia, City of LaGrange, Georgia, Public Service Company of North Carolina, Incorporated, and South Carolina Electric & Gas Company.

first finding that the abandonment will not negatively affect the present or future public convenience and necessity.

3.0 LOCATION AND DESCRIPTION OF PROPOSED FACILITIES

The Project would include installation of new pipeline in Virginia, compressor station modifications at three existing facilities in Virginia, reversal and/or deodorization modifications at eight existing facilities in South Carolina, Georgia, and Louisiana, and modifications at 13 existing mainline valve (MLV) sites in South Carolina and Georgia. Location maps can be found in appendix A.

3.1 Manassas Loop

The Manassas Loop consists of the addition of 7.7 miles of new 42-inch-diameter pipeline. The route would originate at the existing MLV 180-15 site in Fauquier County, Virginia and extend along the existing Transco Mainline to the existing Nokesville Meter Station in Prince William County, Virginia. The pipeline would be co-located or adjacent with the existing Transco Mainline right-of-way for the entirety of the route except for a 0.3-mile pull-out to avoid paralleling a waterbody (SFQ14, Unnamed Tributary to Walnut Branch).

Crossover piping and pig⁴ traps would be located at the termini of the Manassas Loop to facilitate inline inspections as part of the Transco pipeline integrity program. The crossover piping and pig traps would be located within the MLV 180-15 site and the MLV 180-22 site.

3.2 Compressor Station (Station) 185

Project activities at the existing Station 185 in Prince William County, Virginia would include uprating the existing electric-driven existing compression Unit No. 11 driver from 25,000- to 30,000-HP and regearing the associated variable speed drive. Temporary impacts associated with equipment staging and vehicle parking and ground-disturbing activities would be limited to previously disturbed areas at the existing Station 185 facility. No new access roads or upgrades to existing roads would be required for construction and/or operation of the facility.

3.3 Station 175

Project activities at the existing Station 175 in Fluvanna County, Virginia would include the addition of one new turbine-driven 22,490 International Organization for Standardization (ISO) HP compression unit and station cooling, uprating of the existing electric-driven compression Unit No. 1 driver from 33,000- to 41,250-HP, and rewheeling the existing centrifugal compressor. Temporary impacts associated with equipment staging and vehicle parking and ground-disturbing activities would be limited to previously disturbed areas at the existing Station 175 facility. No new access roads or upgrades to existing roads would be required for construction and/or operation of the facility.

3.4 Station 165

Project activities at the existing Station 165 in Pittsylvania County, Virginia would include the addition of two new turbine-driven 22,490 ISO HP compression units, gas cooling, miscellaneous yard and unit piping modifications for existing Unit Nos. 11 and 12, and demolition of the existing reciprocating compressor Unit Nos. 1 through 10 along with all related buildings and ancillary equipment. The existing Units Nos. 11 and 12 currently provide compression to the Transco Mainline. The piping

⁴ A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes

modifications to Unit Nos. 11 and 12 would add the additional capability to supply gas to the Transco South Virginia Lateral, as that function is currently served by Unit Nos. 6 through 8, which are to be permanently retired and demolished. Transco currently owns multiple parcels at the Station 165 site, which include the existing Station 165 and Station 166 facilities and buffer areas. New permanent facilities and temporary impacts associated with equipment staging and vehicle parking would occur within these parcels. Project activities at Station 165 would include an approximately 20-acre area adjacent to the existing Transco facility. All other Project activities at aboveground facilities would occur within existing facility boundaries. No new access roads would be required for construction, however upgrades to existing roads would be required for construction and/or operation of the facility.

3.5 Mainline Facility Station Reversals and Deodorization Modifications

Proposed modifications to the Transco facilities in Louisiana, South Carolina, and Georgia would facilitate flow reversal and/or deodorization of controlled gas release points on the Transco system. Locations of these facility modifications are listed in table 1 and depicted in appendix A. Project activities would be limited to previously disturbed areas at the existing facilities and Transco Mainline right-of-way. No new permanent facilities would be added outside of the existing facility boundaries. No new access roads or upgrades to existing roads would be required for construction and/or operation of the facilities. No tree clearing or impacts on wetlands or waterbodies would occur as a result of Project activities at the sites. Modifications would include the addition of new piping, valves, and/or equipment within the existing station boundaries.

Mainline Facility Station Reversals and Deodorization Modification Locations		
Transco facility	County	State
Station 65	St. Helena Parish	Louisiana
Station 115	Coweta	Georgia
Station 116	Carroll	Georgia
Station 120	Henry	Georgia
Station 125	Walton	Georgia
Station 130	Madison	Georgia
Station 135	Anderson County	South Carolina
Station 140	Spartanburg	South Carolina

3.6 Mainline Valve Deodorization Modifications

Modifications at 13 existing MLV facilities in South Carolina and Georgia along the Transco Mainline for supplemental mainline deodorization. Descriptions and locations of each modification are listed in table 2, and maps of the proposed facilities are included in appendix A. No tree clearing is proposed for these facility modifications.

3.7 Mainline Valves

Transco would expand two existing MLV sites and would install one new MLV site along the Manassas Loop as part of the Project. Transco is planning to use remotely operated MLVs (controlled primarily from the Transco Pipeline Control Houston facility in Houston, Texas) that have manual operation capabilities. The use of remotely operated MLVs with the option to use manual operation would enable Transco to meet required response times for each MLV. The locations of MLVs are summarized in table 3 and depicted in appendix A.

Table 2			
Mainline Valve Deodorization Modification Descriptions and Locations			
Facility	County	State	Site-Specific Description
MLV ^a 115-10	Coweta	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Herring Road. The nearest wetland or waterbody (Tributary to White Oak Creek) occurs more than 1,270 feet east of the site.
MLV 115-20	Fayette	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to the intersection of State Highway 92 and Fairmont Trace. The nearest wetland or waterbody (Ginger Cake Creek) occurs more than 740 feet northeast of the site.
MLV 120-10	Rockdale	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Old Salem Road Southeast. The nearest wetland or waterbody (Tributary to Snapping Shoals Creek) occurs more than 410 feet west of the site.
MLV 120-20	Walton	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Youth Jersey Road. The nearest wetland or waterbody (Unnamed Pond) occurs more than 700 feet east of the site.
MLV 125-10	Oconee	Georgia	Existing fenced MLV site along the existing Transco Pipeline right-of-way (maintained herbaceous with forested areas within the edges of the parcel) adjacent to Potter Road. The nearest wetland or waterbody (Unnamed Pond and associated waterbody/tributary) occurs more than 700 feet east of the site.
MLV 125-20	Clarke	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Nowhere Road. The nearest wetland or waterbody (Lake Chapman) occurs more than 1,790 feet northwest of the site.
MLV 130-10	Hart	Georgia	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to State Highway 172. The nearest wetland or waterbody (Unnamed Pond) occurs more than 835 feet west of the site.
MLV 130-20	Anderson	South Carolina	Existing fenced MLV site along the existing Transco Pipeline right-of-way (maintained herbaceous with forested areas within the edges of the parcel) adjacent to Broadway Lake Road. The nearest wetland or waterbody (Rocky River) occurs more than 2,100 feet west of the site.
MLV 135-10	Greenville	South Carolina	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Beech Springs Road. The nearest wetland or waterbody (Tributary to Williams Branch) occurs more than 315 feet northeast of the site.
MLV 135-20	Greenville	South Carolina	Existing fenced MLV site within existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Jones Mill Road. The nearest wetland or waterbody (Tributary to Howard Branch) occurs more than 440 feet southwest of the site.
North Georgia Lateral Interconnect	Walton	Georgia	Existing fenced facility within and adjacent to the existing Transco Pipeline right-of-way (maintained herbaceous with forested areas within the edges of the parcel) adjacent to James Huff Road. The nearest wetland or waterbody (Mountain Creek) occurs more than 100 feet east of the site.
Savannah River Interconnect	Hart	Georgia	Existing fenced facility within and adjacent to the existing Transco Pipeline right-of-way (maintained herbaceous) accessed from an existing access road from Anderson Highway. The nearest wetland or waterbody (Savannah River) occurs more than 800 feet east of the site.

Table 2			
Mainline Valve Deodorization Modification Descriptions and Locations			
Facility	County	State	Site-Specific Description
Elba Express Interconnect	Anderson	South Carolina	Existing fenced facility within and adjacent to the existing Transco Pipeline right-of-way (maintained herbaceous) adjacent to Opry House Road. The nearest wetland or waterbody (Tributary to Savannah River) occurs more than 230 feet south of the site.
a - MLV = mainline valve			

Table 3					
Mainline Valve Descriptions					
MLV No.	MP	County	State	Project Activities	Access
180-15	1568.1	Fauquier	Virginia	Expand existing site to include an additional mainline valve.	AR-FQ-001 (existing Access Road)
180-20	1573.0	Fauquier	Virginia	Expand existing site to include an additional mainline valve.	AR-FQ-007 (existing Access Road)
180-22	1575.9	Prince William	Virginia	Addition of a new mainline valve.	AR-PW-010 (new Access Road)

4.0 PROJECT SCHEDULE AND WORKFORCE

Pending all necessary approvals and authorizations, Transco plans to commence construction in August 2019. Construction schedule and duration would vary per site, based on the scope of construction activities, but would last approximately 11 months overall. Transco anticipates in-service in November 2020.

The Manassas Loop would be constructed as one spread working generally north to south. Modifications to Station 185, Station 175, Station 165, the Mainline Facility Station Reversals and Deodorization Modifications sites, and the Mainline Valve Deodorization Modifications sites would be performed by specialty construction staff. The total construction workforce would vary depending on the phase of construction.

Work typically would be performed as 12-hour work days, 6 days per week except for critical construction activities such as tie-ins, hydrostatic testing, and major crossings such as roads, railroads, and waterbodies. Certain activities may require extended construction hours that may include nighttime or Sunday hours. Transco states that this standard daily schedule would allow for optimal use of daylight hours and offers safer construction conditions during peak construction season. However, circumstances could arise where, for safety reasons, Transco may be unable to end construction at a precise time on a given day. Transco would end construction for the day as soon as practicable and would provide advanced notice of this work to entities such as neighboring landowners, FERC, and stakeholders as necessary.

5.0 PUBLIC PARTICIPATION AND COMMENT

On June 1, 2018, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Southeastern Trail Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Sessions* (NOI). The NOI was published in the Federal Register and mailed to interested parties including federal, state, and local officials; agency representatives; Native American tribes; local libraries and newspapers; and property owners affected by the proposed facilities.

On June 18, 19, and 20, 2018, we conducted public scoping sessions in Nokesville, Scottsville, and Chatham, Virginia, respectively, to provide an opportunity for stakeholders to learn more about the Project and identify issues to be addressed in the EA. Approximately 10 people attended the scoping sessions altogether. The transcripts of the public scoping session and all written scoping comments are part of the public record for the Project and are available for viewing on the FERC website using the eLibrary link.

We received four written and two verbal comments in response to the NOI from the Virginia Department of Conservation and Recreation, the Teamsters National Pipeline Labor Management Cooperation Trust, and four landowners. The comments primarily concerned the Project's impacts on the FERC process, sensitive habitats and species, land use, noise, and safety. Comments received during the scoping period are addressed in the applicable sections of the EA.

We received a comment regarding our process, including suggestions to prioritize public interest over industry; hold multiple public hearings for projects; extend our comment period; prohibit the practice of hiring third-party contractors; and address upstream, downstream, and climate change impacts in our NEPA documents. Another comment stated facts presented by applicants should be verified by an independent source. While these comments are noted, our scoping process and analysis have followed all requirements of NEPA and the Commission's regulations and policy.

We also received a comment regarding noise pollution at the Nokesville Meter Station in Nokesville, Virginia. The Nokesville Meter Station is not a part of this Project. The Project-related noise and safety concerns raised in this comment are addressed in the safety section of this EA.

We received a comment regarding an alternative to the pipeline route, which is addressed in section B.9.4.

6.0 LAND REQUIREMENTS

Construction requirements include all temporary workspace areas, existing permanent easement or fee property, new permanent easement, and access roads associated with the Project. The footprint of all Project-related disturbances during construction (temporary plus permanent construction workspace) would be 507.7 acres. Table 4 provides a summary of the acreages of land required for construction (temporary) and operation (permanent impacts) of the Project.

The Manassas Loop would consist of the addition of 7.7 miles of new 42-inch-diameter pipeline. Construction of the Manassas Loop would require a temporary 110-foot-wide right-of-way, and of this, a 50-foot-wide permanent right-of-way would be centered on the pipeline in most areas. The Manassas Loop would be located at a 25-foot offset from the existing Transco Mainline C pipeline for the majority of the route. Approximately 0.3 mile would deviate from the existing right-of-way to avoid paralleling an unnamed tributary to Walnut Branch. The temporary construction right-of-way would overlap with the

Land Requirements for the Southeastern Trail Project		
Facility	Temporary Disturbance (acres) ^a	Permanent Disturbance (acres)
Manassas Loop	75.5	25.2
Station 185 ^b	--	--
Station 175	28.6	7.2
Station 165	72.1	10.0
Mainline Facility Station Reversals and Deodorization Modifications	176.4 ^e	0.0 ^e
Mainline Valve Deodorization Modifications	14.7 ^e	0.0 ^e
Access Roads ^c	1.7	0.2
Contractor Yards / Staging Areas ^d	54.9	--
Additional Temporary Workspace	42.1	--
Total	466.0	42.6
<p>a - Temporary Disturbance acreage shown is only for that portion of the disturbance area that extends beyond the permanent right-of-way.</p> <p>b - All work at Station 185 would be conducted within the exiting compressor building.</p> <p>c - Access road widths presented are conservative estimates for purposes of calculating impacts. No road widening is planned as a part of the Project.</p> <p>d - Other than the Catlett Road Contractor Yard, Transco is currently identifying other suitable locations for Contractor Yards / Staging Areas and would coordinate lease agreements with the respective landowners.</p> <p>e - Project activities would be limited to Transco property within the existing fenceline at the Mainline Facility Station Reversals and Deodorization Modifications and Mainline Valve Deodorization Modifications sites. No new permanent or temporary disturbance would occur outside of the existing facility boundaries.</p>		

Transco Mainline right-of-way, typically by 40 feet, during construction. The permanent right-of-way for the Manassas Loop would include 25 feet of the existing Transco Mainline right-of-way and 25 feet of new permanent right-of-way over the length of the pipeline to facilitate operation and maintenance. Locations and extent of Project work areas that would overlap existing right-of-way are depicted on the Project aerial alignment sheets provided in appendix B. The beginning and end mileposts for collocation of the Manassas Loop are provided in table 1 of appendix C.

Modifications to the Transco facilities in Virginia, Louisiana, South Carolina, and Georgia would occur mainly within the existing facility boundaries and include modifications to existing facilities, flow reversal, and/or deodorization and are discussed in section A.3.

6.1 Access Roads, Staging Areas/Pipe Yards, and Additional Temporary Workspace

Transco proposes to use eight existing and construct two new roads to access the construction right-of-way for pipeline and aboveground facility construction. Transco would not widen any roads as part of the Project, but would modify or improve existing roads to safely support the anticipated equipment. Project personnel would use existing parking or approved contractor yards/staging areas and access roads for vehicle parking. Once construction is complete, access roads would be restored to pre-construction condition or better, as requested by the landowner(s). The acreage of impact from the expansion of these access roads is described in table 5.

Extra workspace, including additional temporary workspaces (ATWS) and staging areas, are typically needed in areas that require special construction techniques such as road bores, wetland and waterbody crossings, equipment staging along the temporary construction right-of-way, construction matt storage, fenceline crossings, side slope areas, and at locations where additional volumes of spoil would be

generated. Transco would also require contractor yards for contractor management offices and storage of pipe materials. Transco has proposed to utilize an irregularly-shaped area northeast of Catlett and Dumfries Road in Fauquier County, Virginia as a contractor yard. Transco would configure this yard to avoid impacts to two ephemeral waterbodies that extend diagonally through the parcel. Equipment bridges would be constructed across the waterbodies prior to use of the site to facilitate safe travel of construction equipment and avoid impacts to the waterbodies in accordance with the Transco Procedures. Upon Project completion, this area, and any others approved via variance requests, would be restored to preconstruction condition in accordance with landowner agreements. Transco has identified 105 ATWS areas, which includes ATWS, staging areas, and the proposed pipe yards, are identified in table 2 in appendix C.

7.0 NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, the Commission is required to consider, as part of its decision to approve facilities under Commission jurisdiction, all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. The following non-jurisdictional facilities are associated with the Project.

7.1 Manassas Loop

Electric power would be required for MLV 180-22, which would be provided by the Northern Virginia Electric Cooperative (NOVEC). It is anticipated that electric power would be supplied to the MLV 180-22 site via the existing transmission line service located along Reid Lane without the need for an electrical substation. Construction of the power line is anticipated to be along the existing right-of-way for AR-PW-010 in an area 500 feet by 15 feet, and would therefore not require additional impacts. It is anticipated that the transmission line company would construct, own, and operate the power line and facilities. No environmental permits are anticipated to be required for construction.

7.2 Station 165

Modifications to the existing electrical transformer would be required at Station 165 to support the addition of the new ISO 22,490 HP turbine-driven compression units, station cooling, and miscellaneous piping modifications. The modification to the existing electrical transformer would occur within Transco property at Station 165. The dimensions of these facilities within Station 165 would be 400 feet by 20 feet. The Mecklenburg Electric Cooperative would be responsible for permitting the electrical power lines and transformer at this site. No environmental permits are anticipated to be required for the power lines or transformer.

Table 5

Access Roads for the Southeastern Trail Project

Road		Transco Mainline MP ^a	New/ Existing	Public/ Private/ New	Current Conditions			Proposed Operations Use	Temporary Impacts (acres)	Permanent Impacts (acres)
ID No.	Road Name				Surface Type	Width (feet) ^b	Length (feet)			
Southern / Manassas Loop										
AR-FQ-001	unnamed road (driveway from Bristersburg Road)	1568.2	existing	private	dirt	14	48	existing permanent access road to MLV 180-15	(existing access road)	
AR-FQ-002	private road	1568.6	existing	private	gravel	10	1,166	none	0.3	--
AR-FQ-003	new road from private drive	1569.2	new	new	gravel	20	384	none	0.2	--
AR-FQ-004	private drive	1569.3	existing	public	gravel	9	415	none	0.1	--
AR-FQ-005	private drive	1571.3	existing	public	dirt	11	1,213	none	0.4	--
AR-FQ-006	private drive	1572.1	existing	private	gravel	12	1,326	none	0.4	--
AR-FQ-007	unnamed road (driveway from Old Nokesville Road)	1573.0	existing	private	gravel	28	76	existing permanent access road to MLV 180-20	(existing access road)	
AR-PW-008	unnamed road (from Old Nokesville Road)	1573.2	existing	private	asphalt	10	208	none	0.1	--
AR-PW-009	unnamed road (from Reid Lane)	1574.3	existing	private	dirt	12	270	none	0.1	--
AR-PW-010	unnamed road (from Reid Lane)	1575.9	new	new	dirt	20	441	new permanent access road to MLV 180-22	--	0.2
Total									1.5	0.2

a - Nearest MP at which access road intersects construction ROW.

b - Access road widths presented are conservative estimates for purposes of calculating impacts. No road widening is planned as a part of the Project.

8.0 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

The proposed facilities would be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (USDOT) Minimum Federal Safety Standards in 49 CFR 192. The USDOT's regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. Part 192 specifies material selection and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Transco proposes to follow the construction procedures and mitigation measures contained in the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan (Plan)* and *Wetland and Waterbody Construction and Mitigation Procedures (Procedures)*,⁶ with substantive modifications as detailed in tables 6 and 7. We have reviewed these proposed modifications to the Commission's Plan and Procedures and find them acceptable. Therefore, Transco would follow its Project-specific Plan and Procedures (Transco's Plan and Procedures), which include these approved modifications. Transco would incorporate these alternate measures into its Erosion and Sediment Control Plan (E&SC Plan), which would comply with Virginia Department of Environmental Quality (VDEQ) and be finalized and submitted to the Commission prior to construction.

Transco would use conventional techniques for buried pipeline construction and aboveground facility construction and follow the requirements set forth in its Plan and Procedures to ensure safe, stable, and reliable transmission facilities consistent with Commission and USDOT specifications. Typical construction right-of-way cross sections are provided in figure 1.

In addition to its Plan and Procedures, Transco has prepared an acceptable *Construction Spill Prevention, Control, and Countermeasures Plan (SPCC Plan)*,⁷ which contains measures to prevent and respond to any inadvertent releases of hazardous materials as well as notification procedures in the event of a release.

Transco proposes to implement a third-party compliance monitoring program on the Project that would be under the direction of FERC staff. FERC staff would have a full-time inspector in the field under this program. Transco would also use at least two full-time environmental inspectors (EI) during construction of the Project. The EI would be on site during Project construction activities to ensure compliance with the construction procedures contained in Transco's Plan and Procedures. A full list of the EI's duties is presented in section II.B of Transco's Plan. The EI's responsibilities include:

- ensuring compliance with applicable federal, state, and local environmental permits;
- ordering corrective actions for acts that violate the environmental conditions of the Commission's Certificate, or any other authorizing document;
- ensuring compliance with site-specific construction and restoration plans or other mitigation measures and landowner agreements; and
- maintaining construction status reports.

⁶ Copies of the Commission's Plan and Procedures can be accessed on our website (<http://www.ferc.gov/industries/gas/enviro/guidelines.asp>) or obtained through our Office of External Affairs at 1-866-208-3372.

⁷ Transco's SPCC Plan can be found on FERC's eLibrary under accession number 20180411-5132(32818484), page 1481/4375 of the project application.

Table 6

Substantive Modifications to the FERC Upland Erosion Control, Revegetation, and Maintenance Plan

Section	FERC Version ^a	Transco Version ^b	Justification ^c
II.A.4	(No existing text in FERC Version)	Transco agrees to a FERC Third Party Compliance Monitoring Program for non-Federal and Federal land along the length of the Project.	Commits Transco to a FERC Third Party Compliance Monitoring Program for non-Federal and Federal land along the length of the Project.
III.A.1	The project sponsor must ensure that appropriate cultural resources and biological surveys have been conducted.	Transco will ensure that appropriate cultural resources and biological surveys are conducted, as determined necessary by the appropriate federal and state agencies and that the extent of those surveys are sufficient to accommodate possible future need for activities outside certificated work areas (i.e., buffer areas).	Clarifies that biological and cultural surveys have been conducted beyond the Project boundaries.
IV.A.2	The construction right-of-way width for a project shall not exceed 75 feet or that described in the FERC application unless otherwise modified by a Certificate condition. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (such as side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.	The construction right-of-way width for a project shall not exceed that described in the FERC application unless otherwise modified by a Certificate condition.	Removes the conditional 'or' statement.
			Transco proposes to use a 110-foot-wide temporary construction right-of-way for the Manassas Loop and a 75-foot-wide construction right-of-way in wetlands. Transco also proposes to use ATWS in some upland and wetland areas, due to a variety of Project and site-specific considerations. The proposed construction right-of-way would allow Transco to implement the FERC construction measures of the Transco Plan and the Transco Procedures while addressing site

Table 6

Substantive Modifications to the FERC Upland Erosion Control, Revegetation, and Maintenance Plan

Section	FERC Version ^a	Transco Version ^b	Justification ^c
			conditions and meeting safety regulations (29 CFR Part 1926.650-.652, Subpart P).
V.C.8	Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the Plan.	Install a permanent slope breaker across the construction right-of-way at all waterbody crossings . In addition, install sediment barriers as outlined in the Plan.	The Transco version replaces the FERC version with more conservative measure.
V.D.1	Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor	Limit routine vegetation mowing or clearing adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark (point where vegetation has been wrested by normal stream flow or wave action from the banks) , to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic corrosion/leak surveys, a corridor	Clarifies definition of water's edge.
V.D.3.d	In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a-c.	In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a-c, or variances from this timing would be requested by Transco to FERC.	Provides clarification for potential variance requests to complete seeding operations.
VI.B.1.b	The project sponsor shall file with the Secretary for review and written approval by the Director, site-specific justification for each extra work area with a less than 50-foot setback from wetland boundaries, except where adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the site-specific conditions that will not permit a 50-foot setback and measures to ensure the wetland is adequately protected.	The project sponsor shall file with the Secretary for review and written approval by the Director, site-specific justification for each extra work area with a less than 50-foot setback from wetland boundaries, except where adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the site-specific conditions that will not permit a 50-foot setback and measures to ensure the wetland is adequately protected. Transco is proposing to locate extra work area within 50 feet of the wetlands shown in the table that follows. Justification is provided for each location.	Provides proposed justification for additional workspace closer than 50 feet from the edge of wetlands listed in table 8.

a – May 2013 FERC Upland Erosion Control and Maintenance Plan.

Table 6

Substantive Modifications to the FERC Upland Erosion Control, Revegetation, and Maintenance Plan

Section	FERC Version ^a	Transco Version ^b	Justification ^c
b – Changes indicated in <i>bold italic</i> text.			
c - Justification stating rationale for each proposed modification; Modifications are required to provide equal or greater measures than those provided in the FERC Plan.			

Table 7

Substantive Modifications to the FERC Wetland and Waterbody Construction and Mitigation Procedures

Section	FERC Version ^a	Transco Version ^b	Justification ^c
I.B.1	<p>a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction;</p> <p>b. "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction; and</p> <p>c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.</p>	<p>a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;</p> <p>b. "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and</p> <p>c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.</p>	Clarifies that the width of a given crossing would be determined at the time that the features is crossed rather than being determined for the duration of construction.
IV.A.1.c	Fuel trucks transporting fuel to on-site equipment travel only on approved access roads;	Fuel trucks transporting fuel to on-site equipment travel on approved access roads or on the construction right-of-way ;	Fuel trucks may need to travel along the construction right-of-way to deliver fuel due to the distance between access points for the Project.
IV.A.1.d	All equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary.	All equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary with the exception of proposed dry stream crossings using the dam and pump crossing method. Refueling of pumps will be necessary within 100 feet of the associated waterbody to be crossed.	<p>Refueling of pumps would be necessary within 100 feet of the associated waterbody to be crossed using the dam and pump crossing method.</p> <p>Secondary containment would be provided for overnight storage. A Spill Prevention, Control, and Countermeasures Plan has been developed for the Project and would be implemented during construction.</p>
V.B.2.a	Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.	Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge. Water's edge shall be considered the location where vegetation has been wrested by normal stream flow or wave action from the banks.	Clarifies definition of water's edge.
V.B.2.b	The project sponsor shall file with the Secretary for review and written approval by the Director, site-specific justification for each extra work area with a less than 50-foot setback from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the conditions	The project sponsor shall file with the Secretary for review and written approval by the Director, site-specific justification for each extra work area with a less than 50-foot setback from the water's edge, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land. The justification must specify the conditions that will not permit a 50-foot setback and measures to ensure the waterbody is adequately protected. Transco is	Provides proposed justification for additional workspace closer than 50 feet from the water's edge of waterbodies listed in table 9.

Table 7

Substantive Modifications to the FERC Wetland and Waterbody Construction and Mitigation Procedures

Section	FERC Version ^a	Transco Version ^b	Justification ^c
	that will not permit a 50-foot setback and measures to ensure the waterbody is adequately protected.	<i>proposing to locate extra work area within 50 feet of the waterbodies shown in the table that follows. Justification is provided for each location.</i>	

a – May 2013 FERC Wetland and Waterbody Construction and Mitigation Procedures.

b – Changes indicated in ***bold italic*** text.

c - Justification stating rationale for each proposed modification; Modifications are required to provide equal or greater measures than those provided in the FERC Procedures.

Table 8					
Extra Workspace (Additional Temporary Workspace) Located Within 50 feet of a Wetland					
Facility / ATWS	MP	Wetland ID	Distance from ATWS (feet)	Wetland Type	Justification
Manassas Loop					
FQ-001	1568.1	WFQ01	10	Palustrine Emergent	Staging Area / Fabrication
FQ-001	1568.1	WFQ02	8	Palustrine Forested	Staging Area / Fabrication
FQ-002	1568.1	WFQ01	6	Palustrine Emergent	Staging Area / Fabrication
FQ-028	1569.8	WFQ14	32	Palustrine Forested	Waterbody Crossing
FQ-029	1569.8	WFQ12	28	Palustrine Emergent	Waterbody Crossing
FQ-032	1569.9	WFQ16	48	Palustrine Emergent	Topsoil Segregation
FQ-033	1570.1	WFQ17	48	Palustrine Forested	Topsoil Segregation
FQ-034	1570.1	WFQ19	47	Palustrine Emergent	Topsoil Segregation
FQ-044	1571.1	WFQ08	47	Palustrine Forested	Drag Section
PW-089	1574.8	WPW05	35	Palustrine Emergent	Side Slope / Waterbody Crossing
PW-096	1575.6	WPW08	48	Palustrine Forested	Side Slope / Waterbody Crossing
PW-101	1575.9	WPW06	4	Palustrine Forested	Staging Area / Fabrication / Set-Up
PW-101	1575.9	WPW07	35	Palustrine Emergent	Staging Area / Fabrication / Set-Up
<p>Steep Slope/Side Slope: Waterbody / wetland located at the base of a steep slope where suitable areas for spoil storage are limited or not available, or in areas with significant side slopes where additional spoil storage is required.</p> <p>Waterbody Crossing: Identified wetlands are associated with a waterbody crossing. As outlined in greater detail in the Summary of Modification section at the beginning of the Transco Procedures, extra workspace is required for additional trench width / bank cut-bank due to additional depth of trench under waterbody. This leads to increased width of ROW for fabrication of bent-pipe section and spoil storage at waterbody crossings.</p> <p>Road Crossing: Identified waterbody/wetlands are associated with a road crossing. The extra workspace is required for added depth of the bore under the roadway. This leads to increased width of ROW for fabrication of bore pipe section and spoils storage at road crossings.</p>					

Transco would conduct environmental training sessions in advance of construction to ensure that all individuals working on the Project are familiar with the environmental mitigation measures appropriate to their jobs and the EI's authority.

Table 9

Extra Workspace (Additional Temporary Workspaces) Located Within 50 feet of a Waterbody

Facility / ATWS	MP	Waterbody ID	Distance from ATWS (feet)	Waterbody Type	Justification
Manassas Loop					
FQ-001	1568.1	WBFQ01	6	Pond	Staging Area / Fabrication
FQ-001	1568.1	SFQ02	0	Ephemeral	Staging Area / Fabrication
FQ-001	1568.1	SFQ03	0	Perennial	Staging Area / Fabrication
FQ-001	1568.1	SFQ04	40	Perennial	Staging Area / Fabrication
FQ-002	1568.1	WBFQ01	22	Pond	Staging Area / Fabrication
FQ-002	1568.1	SFQ03	9	Perennial	Staging Area / Fabrication
FQ-003	1568.2	SFQ04	33	Ephemeral	Staging Area / Fabrication
FQ-004	1568.2	SFQ04	39	Ephemeral	Bore Spoil
FQ-017	1569.1	SFQ08	44	Ephemeral	Staging Area / Spread Turnaround
FQ-018	1569.1	SFQ08	49	Ephemeral	Road Crossing
FQ-020	1569.2	WBFQ03	36	Pond	Topsoil Segregation
FQ-028	1569.8	SFQ16	21	Perennial	Waterbody Crossing
FQ-029	1569.8	SFQ16	23	Perennial	Waterbody Crossing
FQ-030	1569.8	SFQ16	4	Perennial	Waterbody Crossing
FQ-038	1570.6	SFQ23	34	Ephemeral	Waterbody Crossing
FQ-039	1570.6	SFQ23	11	Ephemeral	Side Slope
FQ-040	1570.6	SFQ23	28	Ephemeral	Side Slope
FQ-051	1572.1	SFQ11	39	Ephemeral	Waterbody Crossing
FQ-052	1572.1	SFQ11	43	Ephemeral	Side Slope
FQ-062	1572.7	SFQ14	42	Perennial	Point of Inflection
PW-085	1574.7	SPW05	33	Perennial	Spoil Storage
PW-087	1574.7	SPW05	25	Perennial	Spoil Storage
PW-088	1574.7	SPW06	45	Perennial	Drag Section
PW-101	1575.9	SPW08	15	Perennial	Staging Area / Fabrication / Set-Up

Side Slope: Waterbody / wetland located at the base of a steep slope where suitable areas for spoil storage are limited or not available, or in areas with significant side slopes where additional spoil storage is required.

Waterbody Crossing: Identified wetlands are associated with a waterbody crossing. As outlined in greater detail in the Summary of Modification section at the beginning of the Transco Procedures, extra workspace is required for additional trench width / bank cut-bank due to additional depth of trench under waterbody. This leads to increased width of ROW for fabrication of bent-pipe section and spoil storage at waterbody crossings.

Road Crossing: Identified waterbody/wetlands are associated with a road crossing. The extra workspace is required for added depth of the bore under the roadway. This leads to increased width of ROW for fabrication of bore pipe section and spoils storage at road crossings.

8.1 Clearing and Grading

Clearing operations include removing brush, trees, roots, and other obstructions such as large rocks and stumps within the construction right-of-way or construction work areas. Transco's proposed pipeline loop consist mainly of agricultural, open land, and forested land. Transco would clear trees along the pipeline right-of-way only between September 16 and April 14 to minimize impacts on listed bat species and birds. Timber would be removed only when necessary for construction purposes. Merchantable timber may be limbed, cut, and removed from the right-of-way. Timber that is not merchantable and other vegetative debris may be chipped, burned, or disposed of according to applicable regulations. Burning, if used, would be conducted in accordance with state and local burn permits and regulations and performed in a manner to minimize fire hazard and prevent heat damage to surrounding vegetation. At this time, locations, times, and amounts of prescribed open burning are unknown. Stumps and other timber considered non-merchantable could be used to construct off-road vehicle barriers at the request of appropriate landowners. Disposal of materials taken offsite would be performed at commercial facilities or at other approved locations.

Transco stated it would prefer to stockpile vegetative debris and redistribute the material on the right-of-way. Transco also proposes that stumps may be buried in non-tilled land on the construction work area and with the agreement of the appropriate landowner. We address these practices further in section B.4.1 of this EA with regards to the Plan's construction debris disposal requirements.

Grading of the construction right-of-way would be necessary for the movement of heavy equipment and safe passage for work crews.

8.2 Trenching

In accordance with Transco's Plan, measures would be employed to minimize soil erosion during trenching. In addition, measures such as trench breakers would be taken to prevent the flow of water through the trench.

A maximum of 12 inches of topsoil would be removed or stripped, and segregated in agricultural lands that are annually cultivated or have crops rotated. Areas outside of agricultural areas may be stripped at the request of a land management agency or landowner(s). If the topsoil is less than 12 inches in depth, the actual depth of the topsoil would be removed and segregated. Up to 12 inches of topsoil may be removed and segregated unless topsoil replacement is determined to be more efficient by the contractor or when requested by landowners in residential areas.

Drain tiles and irrigation systems would be restored to landowner specifications after pipeline installation so as not to impact future agricultural operations. In addition, the pipeline would be constructed to not interfere with the construction of other utilities.

The Project would require a total of 16 roadway crossings, 1 railroad crossing, and 8 major utility line crossings (tables 10 and 11). Three public roads, the railroad crossing, and one major utility would be crossed using the uncased bore method (described in section A.8.9), and the remaining crossings would be performed using the open-cut construction technique. Transco would ensure that detours or other measures are provided to permit traffic flow during construction. If necessary, traffic control measures would be coordinated with the appropriate state or local agency with jurisdiction over the affected road.

8.3 Pipe Bending, Stringing, Preparation, and Lowering In

Where necessary, bending of the sections of pipe would be performed by track-mounted hydraulic pipe-bending machines at the Project site. After the pipe has been bent where necessary, it would be aligned and welded. Each weld would be inspected visually and radiographically (or by another nondestructive testing method) by qualified inspectors.

Pipe would be protected with an external coating designed to protect the pipe from corrosion. Except for a small area at the end of the pipe joint, this coating is applied at the pipe mill before shipment to the site. After welding together in the field, pipe joints would be coated with similar or compatible materials. The pipe coating would be inspected for defects with special attention provided to field-applied coatings before lowering the pipe into the trench. Any defects would be repaired prior to lowering-in, in accordance with construction specifications.

Set-on weights may be necessary to provide negative buoyancy to the pipe. If applied in the Project area, no concrete coating fabrication would take place within 100 feet of a waterbody or wetland.

Side boom tractors would be used to lower the pipe into the trench. The ditch would be free of debris and foreign material. If the bottom of the trench is rocky, the pipe may be lowered onto sandbags, support pillows, sand, gravel, or screened soil, excluding topsoil. In areas where the excavated trench material may damage the pipe, the pipe would be protected with a wrap of rock shield. The pipe would be placed in the ditch so as to conform to the alignment of the ditch and to not damage the coating. Trench dewatering, to prevent the pipe from floating and to perform certain limited activities in the trench, would be performed in accordance with Transco's Procedures.

Table 10				
Road and Railroad Crossings for the Southeastern Trail Project				
Road/Railroad Name	Transco Mainline MP	Existing Use	Surface Type	Crossing Method
Southern / Manassas Loop				
Bristersburg Road	1568.2	Public	Asphalt	Open Cut
Old Calverton Road	1568.7	Public	Gravel	Open Cut
Catlett Road	1569.2	Public	Asphalt	Uncased Bore
Norfolk Southern Railroad	1569.2	Private	Gravel	Uncased Bore
Private Road	1569.3	Private	Gravel	Open Cut
Elioak Lane	1570.8	Private	Asphalt	Open Cut
Old Dumfries Road	1570.8	Public	Asphalt	Uncased Bore
Private Road	1571.3	Private	Dirt	Open Cut
Private Road	1572.2	Private	Gravel	Open Cut
Prince William Road	1573.4	Public	Gravel	Open Cut
Prince William Road (Private)	1573.2	Private	Gravel	Open Cut
Private Road	1573.2	Private	Gravel	Open Cut
Fauquier Drive	1573.4	Public	Asphalt	Uncased Bore
Private Road	1574.3	Private	Dirt	Open Cut
Reid Lane	1574.4	Public	Asphalt	Open Cut
Fitzwater Drive	1574.9	Public	Asphalt	Open Cut
Reid Lane	1575.7	Public	Asphalt	Open Cut

Table 11				
Major Utility Line Crossings for the Southeastern Trail Project				
Utility Description	Transco Mainline MP	Utility Owner	Status ^a	Crossing Method
Southern / Manassas Loop				
Communication Fiber Cable	1568.2	AT&T	Active	Open Cut
Communication Fiber Cable	1568.8	AT&T	Active	Open Cut
Communication Fiber Cable	1569.2	Sprint	Active	Uncased Bore
24-Inch Natural Gas Pipeline	1575.7	CNG Transmission Corp.	Active	Open Cut
High Voltage Overhead Power Line	1575.7	Dominion Virginia Power	Active	--
High Voltage Overhead Power Line	1575.7	Dominion Virginia Power	Active	--
High Voltage Overhead Power Line	1575.8	Dominion Virginia Power	Active	--
High Voltage Overhead Power Line	1575.8	Dominion Virginia Power	Active	--
a - Unless otherwise advised, Transco would assume that all utilities are active and would make the appropriate notifications prior to working under or around major below and aboveground utility lines.				

8.4 Backfilling and Grade Restoration

After the pipe is lowered into the trench, the trench would be backfilled using the material originally excavated from the trench. However, additional backfill from other sources may be required in some cases. Excess excavated materials or materials unsuitable for backfill would be spread evenly over the right-of-way or disposed of in accordance with applicable regulations. In areas where topsoil has been segregated, the subsoil would be placed in the trench first and then the topsoil would be placed over the subsoil. Backfilling would occur to grade or higher to accommodate future soil settlement. Tilling of the subsoil and topsoil would be performed at the request of the landowner.

The natural contour of the ground and surface drainage patterns would be restored to preconstruction conditions during backfilling. Sandbags or foam-type trench breakers would be placed across the trench prior to backfilling to minimize the possibility of subsurface water flow in the trench on slopes along the pipeline. The trench backfill would be solidly compacted in other areas such as terrace, levee, and waterbody crossings and the banks at waterbody and ditch crossings. Trench plugs may be used to minimize the flow of water from a waterbody or wetland to and from the trench when the trench crosses waterbodies or wetlands.

8.5 Testing

The pipeline would be tested hydrostatically in accordance with 49 CFR 192 to verify pipeline integrity and ability to withstand designed maximum operating pressures. The pipeline would be cleaned using a pig prior to hydrostatic testing. After the testing is completed, the line would be depressurized and the water discharged. Test water intake and discharge would occur in accordance with applicable state water regulations and federal and state discharge requirements. Test water would be withdrawn from approved sources. Transco expects to use municipal water sources for hydrostatic testing, however if surface water sources are used, the water intake would be screened to prevent entrainment of aquatic life. After hydrostatic testing is complete, the test water would be discharged into well vegetated upland areas utilizing energy dissipation devices such as hay bales to minimize erosion and sedimentation. Some chemicals may be used for dechlorinating municipal water sources, if required. No other chemicals would be added to the hydrostatic test water and no chemicals would be used to dry the pipeline after testing. For additional detail regarding hydrostatic testing, see section B.3.2.

8.6 Cleanup and Restoration

Weather and soil conditions permitting, final cleanup would occur within 20 days after the trench is backfilled (within 10 days in residential areas). After backfilling is complete, all disturbed areas would be graded to the original contours, any remaining debris properly disposed, permanent erosion controls constructed or installed, and the right-of-way seeded with an appropriate seed mix, or sodded with soil-holding grass. Examples of typical erosion control devices include slope breakers, sediment barriers (such as silt fence or straw bales), and mulch. All restoration activities would be completed according to Transco's Plan and Procedures. Seeding would be completed according to the recommendations of the National Resource Conservation Service (NRCS) and landowner agreements.

8.7 Traffic

Transco states that the impact on traffic and transportation facilities and public inconvenience at road crossings would be minimized to the extent practicable. Appropriate safety procedures would be implemented to protect workers and the public. Traffic warning signs and other traffic control devices would be used as required by federal, state, and local DOT and other regulating bodies.

8.8 Special Pipeline Construction Procedures

Transco would use special construction techniques when construction across roads and railroads, underground utilities, wetlands, and waterbodies as described below.

Road and Railroad Crossings

Construction across paved roads, highways, and railroads would be conducted in accordance with Transco's Plan and Procedures and requirements identified in road and railroad crossing permits or approvals. Existing railroads would be crossed by boring under the railroad. Roads, highways, and railroads where traffic cannot be detoured would be crossed using the conventional subsurface boring. Typically, there would be little or no disruption to traffic at road, highway, or railroad crossings during boring operations. If an open-cut road requires an extensive construction duration, provisions would be made for detours or other measures to permit traffic flow during construction. If necessary, traffic control measures would be coordinated with the appropriate state or local agency with jurisdiction over the affected road.

The pipeline would be installed at a minimum depth of 5 feet below the center of the road and a minimum of 10 feet below the railroad or as required by applicable crossing permits and approvals, and would be designed to withstand anticipated external loadings. ATWS would be required at road and railroad crossings to accommodate the extra spoil generated from the entrance and exit pits at bored crossings, from the increased excavation depths at open-cut road crossings, and for staging of pipe and vehicle parking. Where the construction right-of-way is accessible from a paved roadway, construction entrances would be installed to minimize tracking of dirt and mud onto the roadway.

Bore Method

The bore method involves excavation of a bore pit on one side of the crossing and a receiving pit on the other side. A boring machine would then cut a shaft under the crossing using a cutting head mounted on an auger. The pipeline would then be pushed or pulled through the hole. The open-cut method for roads involves trenching across the road and then restoring the road to pre-construction conditions following construction.

Underground Utility Line Crossings

The Manassas Loop pipeline would be installed at an appropriate depth (either over or under the existing utility) where existing underground utilities are crossed to meet soil cover and separation requirements in accordance with USDOT regulations and specifications. At least 24 inches of separation between the pipeline and the existing utility line would be maintained where feasible. ATWS may be required at underground utility crossings to accommodate the increased excavation depths and minimize the need to operate equipment or store spoil over existing pipelines.

Wetland Crossings

Wetland boundaries would be delineated and marked in the field prior to construction activities. The pipeline construction right-of-way in wetlands would be limited to 75 feet. Where soils are unstable and saturated, stable temporary work surfaces within the wetlands may be constructed. Timber mats or gravel on geotextile fabric are possible methods of stabilization. Typically, ATWS areas are located a minimum of 50 feet from the edge of wetlands. If a riparian wetland is located adjacent to a waterbody, Transco may request ATWS in the wetland. Woody vegetation within the construction right-of-way would be cut off at ground level and removed from the wetlands, leaving the root systems intact. The pulling of tree stumps and grading activities would be limited to the area directly over the trench line unless it is determined that safety-related construction constraints require grading or the removal of stumps from the working side of the right-of-way.

Construction equipment operating in wetland areas would be limited to that needed to clear the right-of-way, dig the trench, install the pipeline, backfill the trench, and restore the right-of-way. Topsoil segregation would be utilized in unsaturated wetlands to preserve the existing seed bank and aid in the successful restoration of the disturbed wetland. Trench plugs would be installed as necessary to maintain wetland hydrology. Points at which the trench enters and exits the wetland would be sealed with trench breakers to maintain the hydrologic integrity of the wetland, where determined to be necessary by an EI. Best management practices (BMP) would be implemented per the E&SC Plan to comply with VDEQ regulations. Backfill would be well compacted, especially near the edges of the wetlands. Excess backfill would be spread over adjacent upland areas and stabilized during cleanup. After completion of construction, topographic conditions and contours in wetlands would be restored as similar as practicable to the original topographic conditions and contours.

The methods of pipeline construction and the required construction work area width in wetlands would depend upon the soil stability and the existing use and condition of the wetland. Transco would follow its Procedures for construction activities within saturated wetlands. The construction procedures used to cross unsaturated wetlands would be similar to those used in dry land areas. Typical wetland crossing drawings are provided in figure 2.

Waterbody Crossings

Transco would follow its Procedures, relevant federal and state permits, and utilize appropriate BMPs identified in the Project-specific E&SC Plan to minimize the potential for impacts on waterbodies. Where waterbodies have perceivable flow at the time of construction, Transco would use the dam and pump crossing method. Upland crossing methods would be used to cross waterbodies that contain no perceivable flow. Equipment to perform a dam and pump crossing would be onsite as a contingency should perceptible flow in waterbodies begin during construction.

The dam and pump method for waterbody crossings involves installation of temporary dams upstream and downstream of the proposed waterbody crossing location. The temporary dams typically

would be constructed using sandbags and plastic sheeting. Following dam installation, pumps would be used to dewater the upstream impoundment and transport the waterbody flow around the construction work area and trench to the downstream side of the construction work area. Intake screens would be installed at the pump inlets to prevent entrainment of aquatic life, and energy dissipating devices would be installed at the pump discharge point to minimize erosion and waterbody scour. Trench excavation and pipeline installation would then commence through the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfill of the trench, and restoration of waterbody banks, the temporary dams would be removed, and flow through the construction work area would be restored. A typical dam and pump waterbody crossing drawing is provided in figure 3.

Waterbody crossings would be perpendicular to the flow where practicable. Grading at approaches to waterbodies may be required to create a safe work surface and to allow the necessary area for pipe bending. If grading is required, it would be directed away from the waterbody to reduce the possibility of disturbed soils being transported into the waterbody by wind or water erosion.

Temporary equipment crossings (bridges) would be placed across waterbodies to allow for construction equipment to cross the waterbodies with minimal impact during construction. Equipment crossings may consist of prefabricated construction mats, rail flat cars, flexi-float or other temporary bridges, or flume installations. Flume installations include suitably sized flumes and a travel surface consisting of rock fill, sandbags, timber mats, or timber riprap. At equipment bridge locations, care would be taken to minimize disturbance of the waterbody bank and bottom. Equipment crossings would typically be installed during the clearing and grading phases.

At waterbody crossings where rock is not encountered, Transco would place the pipeline deep enough to avoid the potential for scour to expose or uncover the pipe or a minimum of 5 feet below the bottom of the waterbody channel. Where practicable, material excavated from the trench would be stockpiled in upland areas and generally used as backfill unless federal or state permits specify differently. Containment structures for removed material typically would include approved sediment barriers, compost filter socks, silt fences, or straw bales, and would serve to minimize the potential for soil to enter the waterbody.

The right-of-way would be prepared on either side of the waterbody prior to the construction of the actual crossing to limit the time required for construction of a waterbody crossing. Trees would be preserved to the extent practicable when crossing through forested waterbody banks. The waterbody channel would be returned to its original contour to the extent practicable following construction.

Waterbodies that would be crossed and the proposed crossing method for each is discussed in section B.3.2.

Rugged Terrain/Steep Slopes

The upslope side of the construction work area would be cut during grading where severe side slopes are encountered along the Project route. The excavated material would be used to fill the downslope edge of the construction work area to provide a safe and level surface from which to operate heavy equipment. Side-hills may require ATWS to accommodate the storage of excess fill material. During restoration, the spoil would be placed back into the cut and restored to as near as original contours as practicable. Springs or seeps found in the cut would be carried downslope using restoration techniques such as the installation of drainpipes and/or gravel drains. The final determination of the most appropriate method to ensure downhill flow of groundwater seeps or springs in side-hill situations would be made in the field during construction by the contractor in coordination with an EI. The locations of steep side-slopes and other geologic hazards are discussed in section B.1.2

Blasting

Shallow bedrock that cannot be excavated using mechanical means may be encountered during Project construction; blasting would be required for ditch excavation in these areas. During blasting, measures would be implemented to prevent damage to nearby underground structures (cables, conduits, and pipelines) or water wells in accordance with applicable regulations. Blasting mats or soil cover would be used as necessary to prevent the scattering of loose rock. Blasting would be conducted during daylight hours and would not begin until nearby residences, ranchers, businesses, and/or other occupants have been notified. Additional information regarding blasting is provided in section B.1.3. Transco filed a Project-specific Blasting Plan⁸ that was developed in accordance with industry accepted standards, applicable regulations, and permit requirements. We find it acceptable.

8.9 Operations and Maintenance

Transco would operate and maintain the proposed Project facilities in compliance with USDOT regulations (49 CFR 192), Transco's Plan, and federal, state, and local regulations. The Manassas Loop would be surveyed for gas leaks, cathodic protection, and potential ground subsidence through manual surveys occurring approximately every 12 months in conjunction with the existing adjacent Transco pipeline. Aerial surveys of the Manassas Loop would be performed in accordance with the USDOT requirements of 49 CFR 192 as summarized in Table 12.

Class Location of Pipeline	Maximum Interval Between Patrols	
	At Highway and Railroad Crossings	At All Other Places
1, 2	7.5 months; but at least twice each calendar year	15 months; but at least once each calendar year.
3	4.5 months; but at least four times each calendar year	7.5 months; but at least twice each calendar year.
4	4.5 months; but at least four times each calendar year	4.5 months; but at least four times each calendar year.

The additional permanent right-of-way for the Manassas Loop would be maintained in an herbaceous condition, with mowing and tree or shrub sapling clearing typically occurring during the summer. However, Transco would avoid vegetation clearing or mowing between April 15 and August 1 per its Plan. Herbicides would only be used to treat specific invasive exotic vegetation. The aboveground facilities would be monitored primarily from Transco Pipeline Control Houston located in Houston, Texas. Periodic maintenance procedures would include mowing, vegetation trimming, and equipment checks and maintenance.

9.0 PERMITS, APPROVALS, AND REGULATORY REQUIREMENTS

Transco would obtain all necessary federal, state, and local permits, licenses, and clearances related to construction of the proposed facilities. All relevant permits and approvals would be provided to

⁸ Transco's Blasting Plan was filed on April 11, 2018 as Appendix II.F of Transco's project application and can be found by navigating to elibrary.ferc.gov and entering accession number 20180411-5132(32818484).

the respective contractors who would be required to be familiar with and adhere to applicable requirements. Table 13 indicates the permits and approvals required for the Project.

Table 13			
Environmental Permits, Approvals, and Consultations Anticipated for the Southeastern Trail Project			
Permit/Approval/ Consultation	Issue	Date	
		Submittal	Approval
Federal			
Federal Energy Regulatory Commission			
Section 7(c) Natural Gas Act - Certificate of Public Convenience and Necessity	Construction and operation of interstate natural gas pipeline facilities	April 2018	<i>Pending</i>
U.S. Army Corps of Engineers - Norfolk District			
Section 404 Clean Water Act - Nationwide Permit 12 (Notifying)	Dredge and fill activities in Waters of the U.S.	May 2018	<i>Pending</i>
U.S. Fish and Wildlife Service			
Migratory Bird Treaty Act Consultation	Evaluation of the potential to impact migratory birds or associated nests or eggs	July 2018	September 2018
Section 7 Endangered Species Act Consultation	Evaluation of the potential to impact federal-listed species and designated critical habitat	July 2018	August 2018
Consultation under the Bald and Golden Eagle Protection Act	Evaluation of the potential to impact Bald or Golden Eagles	July 2018	September 2018
State			
Virginia Marine Resource Commission			
Section 404 of the Clean Water Act Permit for Construction in the Waters of the Commonwealth and Wetlands	Activities requiring a Section 404 Clean Water Act permit	May 2018	October 2018
Virginia Department of Environmental Quality			
Section 401 Clean Water Act – Water Quality Certification	Activities requiring a Section 404 Clean Water Act permit	May 2018	<i>Pending</i>
Coastal Zone Consistency Determination	Coastal Zone Management	May 2018	<i>Pending</i>
Stormwater Variance Request (Minimum Standard 16 of the Virginia Erosion and Sediment Control Law)	Stormwater discharges associated with construction activities	May 2018	<i>Pending</i>
Air Permits	Minor New-Source Review (Station 175 and Station 165)	May 2018	<i>Pending</i>
Virginia Department of Conservation and Recreation			
Review and consultation regarding state listed endangered and threatened species.	Evaluation of the potential to impact state-listed species and designated critical habitat	August 2018	September 2018

Table 13			
Environmental Permits, Approvals, and Consultations Anticipated for the Southeastern Trail Project			
Permit/Approval/ Consultation	Issue	Date	
		Submittal	Approval
Virginia Department of Game and Inland Fisheries			
Review and consultation regarding state listed endangered and threatened species.	Evaluation of the potential to impact state-listed species and designated critical habitat	May 2018	September 2018
Virginia Department of Agriculture and Consumer Services			
Review and consultation regarding state listed endangered and threatened species.	Evaluation of the potential to impact state-listed species and designated critical habitat	May 2018	August 2018
Virginia Department of Historic Resources			
Section 106 of the National Historic Preservation Act-Agency review, consultation, and comment on cultural resource studies and mitigation plans	Evaluation of the potential to impact cultural resources	May 2018	<i>Pending</i>
County			
Prince William County			
Review, consultation, and comment on cultural resource studies and mitigation plans	Evaluation of the potential to impact cultural resources	May 2018	<i>Pending</i>
Prince William County Department of Public Works	Riparian Protection Areas; Chesapeake Bay Preservation Act	May 2018	April 2018
Fauquier County			
Review, consultation, and comment on cultural resource studies and mitigation plans	Evaluation of the potential to impact cultural resources	May 2018	<i>Pending</i>
Construction Permits			
Road Crossing Permits (Virginia Department of Transportation; Fauquier County)	Public road crossings during construction and construction entrances	<i>Pending</i>	-
Road Crossing Permits (Virginia Department of Transportation; Prince William County)	Public road crossings during construction and construction entrances	<i>Pending</i>	-
Building Permits	Varies per county	<i>Pending</i>	-
Railroad Crossing Permits	Survey access and construction for existing railroad right-of-way crossing (Norfolk Southern)	<i>Pending</i>	-

B. ENVIRONMENTAL ANALYSIS

Construction and operation of the Project would have temporary, short-term, long-term, and permanent impacts. As discussed throughout this EA, temporary impacts are defined as occurring only during the construction phase. Short-term impacts are defined as lasting up to three years. Long-term impacts would eventually recover, but require more than three years. Permanent impacts are defined as lasting throughout the life of the Project.

1.0 GEOLOGY

The existing facilities in Virginia, South Carolina, and Georgia are in the Piedmont Physiographic Province. The existing facility in Louisiana is within the Coastal Plain Physiographic Province (USGS, 2013). Activities at these facilities would be limited to previously disturbed areas within Transco's property boundary or maintained right-of-way. Based on the limited ground disturbance at these sites, the modifications at these facilities would result in minimal impact on geologic resources and are not discussed further in this section, except for Station 165. Transco's adherence to the measures contained in its Plan and Procedures and Project-specific E&SC Plan, would ensure that all disturbed areas at these sites are adequately restored following construction.

The Manassas Loop is within the Piedmont Lowlands Section of the Piedmont Province. The Manassas Loop area is characterized by areas of modest relief underlain by Mesozoic sedimentary and igneous rocks (Roberts and Bailey, 2000). Local relief is typically 220 to 340 feet above mean sea level (USGS, 1978; USGS, 1994).

Station 165 is within the Piedmont Uplands Section of the Piedmont Province. This area is characterized by broad uplands with low to moderate slopes (Roberts and Bailey, 2000) underlain by Triassic sandstone, siltstone, and shale (Luttrell, 1989). Local relief is approximately 620 to 680 feet above mean sea level (USGS, 1990).

1.1 Mineral and Non-Mineral Resources

Based on information from the Virginia Division of Geology and Mineral Resources, no mineral or non-mineral resources, active mines, sand/gravel pits, or quarries were identified within 0.25 mile of the Manassas Loop or Station 165 Project areas (Virginia Division of Geology and Mineral Resources, 2018). Therefore, the Project is not expected to impact these resources.

1.2 Geologic Hazards

Geologic hazards are natural physical conditions that can, when present, result in damage to land and structures or injury to people. Potential geologic hazards in the Project area were determined through database searches, literature and topographic map reviews, and include seismicity (earthquakes and faults), slope stability and landslides, subsidence, flooding/scour, soil liquefaction, soil expansion, and volcanism. The proposed Project sites are not characterized by volcanic or karst conditions, or susceptible to subsidence or flooding; thus, the Project would not be affected by such hazards. Seismic hazards and landslides are discussed below.

Seismic Hazards

Seismic hazards include earthquakes, ground faulting, and secondary effects such as liquefaction. The Project locations are reportedly in areas of low seismic risk. Seismic risk can be quantified by the motions experienced by the ground surface or structures during a given earthquake as expressed in terms

of g (the acceleration due to gravity), or peak ground acceleration. The USGS has developed a series of maps for the entire United States that describe the likelihood for shaking of varying degrees to occur in a given area. The USGS indicates that the Manassas Loop and Station 165 are in areas where a peak ground acceleration of 0.06 to 0.08 g has a 2 percent chance of being exceeded in 50 years, and a peak ground acceleration of 0.02 g has a 10 percent chance of being exceeded in 50 years (Peterson et al., 2014; USGS, 2018a). No faults were identified in the vicinity of the Project areas in Virginia. In addition, saturated soils that could contribute to soil liquefaction are not likely to be present in the majority of the Project areas. The Manassas Loop crosses several very narrow bands of alluvium; however, these bands are near local low points and the risk of significant downslope movement is minimal. As such, we do not anticipate seismic-related impacts on the Project.

Landslides

According to the USGS, which uses data from Radbruch-Hall et al. (Radbruch-Hall et al., 1982), the Manassas Loop has a low landslide susceptibility (USGS, 2018b). The low slopes and types of soils found within the Project area minimizes the landslide exposure. Based on the low likelihood of a landslide along the Manassas Loop, we conclude that there is a low likelihood of landslide hazards impacting the proposed pipeline.

Station 165 has a high susceptibility and a moderate incidence of landslides (USGS, 2018b). To mitigate and avoid the possibility of a landslide, Transco would implement landslide mitigation and avoidance measures that may include post-precipitation work stoppages, temporary and permanent slope breakers, trench plugs that would reduce water channeling, and the use of water bars on slopes that would also direct water off the disturbed right-of-way to adjacent undisturbed areas thereby minimizing conditions influencing the frequency of landslides, such as soil saturation.

1.3 Blasting

As indicated by U.S. Department of Agriculture, NRCS soils data, approximately 109.3 acres (about 77 percent) of the proposed pipeline right-of-way are characterized as having shallow bedrock (five feet or less). If shallow bedrock is encountered, Transco would first attempt to use hydraulic hammers and mechanical rippers to break the rock. If the use of hydraulic hammers and mechanical rippers is not effective, blasting may be required. Where blasting may be required, Transco would make the appropriate notifications and obtain necessary permits prior to blasting. Blasting activities would adhere to local, state, and federal regulations applying to controlled blasting and blast vibration limits concerning structures and underground and aboveground utilities. Transco has prepared a Project-specific blasting plan that includes measures to control, minimize, or eliminate detrimental impacts. We have reviewed this Plan and find it adequate.

Blasting precautions include, but are not limited to, the following:

- inventorying public and private groundwater drinking wells and completing pre-blast water quality monitoring;
- completing pre-blast inspections of nearby residences and other structures;
- installing blasting mats in congested areas, in shallow waterbodies, or near structures that could be damaged by fly-rock;
- posting warning signals, flags, and barricades;
- notifying occupants of nearby buildings, stores, residences, places of business, and places of public gathering, as well as farmers, 72 hours in advance of blasting activities;
- following procedures for safe storage, handling, loading, firing, and disposal of explosive materials; and

- controlling excessive vibration by limiting the size of charges and using charge delays that stagger each charge in a series of explosions.

Transco would conduct the pre-blasting inspections and water quality monitoring with landowner permission to assess the conditions of structures and water wells within 150 feet of the area in which blasting is anticipated. In the event of damage to water wells, Transco would repair or replace the well or compensate the landowner.

With the implementation of the proposed measures above to minimize blasting impacts and monitoring during blasting, we do not anticipate significant impact from blasting activities.

1.4 Paleontology

No known fossil locations were identified within the Project area based on a review of known paleontological sites. The likelihood of encountering and disturbing paleontological resources such as vertebrate fossils or scientifically significant invertebrate or plant fossils during Project construction is considered to be low due to the type of deposits that underlie the Project areas and the previously disturbed nature of the majority of the Project areas. Thus, we conclude that significant paleontological resources are unlikely to be affected by construction or operation of the Project.

2.0 SOILS

Activities at the existing facilities in Virginia, South Carolina, Georgia, and Louisiana would be limited to previously disturbed areas within Transco's property boundary or maintained right-of-way. Based on the limited ground disturbance at these sites, the modifications at these facilities would result in minimal impact on soils and are not discussed further in this section except for Station 165. Transco's adherence to the measures contained in its Plan and Procedures and Project-specific E&SC Plan, would ensure that all disturbed areas at these sites are adequately restored following construction.

The properties and designations of individual soil map units from NRCS sources were used to describe the soil resources associated with the Manassas Loop and Station 165 Project areas and assess potential limitations, impacts, and mitigation measures to be implemented to reduce impacts on soil resources. Construction activities that create soil disturbance, such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the right-of-way, would result in temporary and minor impacts on soil resources. Soil characteristics could affect construction performance or increase the potential for adverse construction-related soil impacts. The activities that have the potential to impact soils and reduce soil quality are the mixing of topsoil with subsoil, bringing excess rocks to the surface, compacting soil by heavy equipment, and disrupting surface and subsurface drainage patterns.

Prime Farmland

The U.S. Department of Agriculture defines prime farmland soils as those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Prime farmland soils can include either actively cultivated land or land that is potentially available for cultivation. Farmland that does not meet the criteria for prime farmland may still be considered farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the local conservation districts. Generally, this land includes 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. Approximately 84.8 acres (about 59 percent) of the

soils temporarily impacted by Manassas Loop construction activities are considered prime farmland or farmland of statewide importance. No permanent conversion of farmland is proposed due to construction of the Manassas Loop. Approximately 82 acres (about 100 percent) of Station 165 is considered prime farmland or farmland of statewide importance. However, none of this land is currently used for agricultural purposes.

Erosion, Runoff, and Sediment Control

Approximately 93.8 percent of soils in the Manassas Loop and 99.9 percent of soils in Station 165 are considered highly susceptible to wind erosion. Approximately 41.4 percent of soils in the Manassas Loop Project area have severe to extreme water erosion potential based on soil characteristics and slope. To minimize or avoid potential impacts from soil erosion and sedimentation to nearby waterbodies, Transco would utilize erosion and sedimentation control devices in accordance with its Plan and Procedures and Project-specific E&SC Plan during construction. Temporary erosion control techniques, including slope breakers, trench breakers, sediment barriers, and re-establishment of stabilizing vegetation would be installed prior to or immediately following any clearing activities, based on site-specific conditions.

Temporary erosion control devices would be inspected on a regular basis as well as after each rainfall event of 0.5 inch or greater to ensure that the controls are functioning properly. In addition, Transco would perform the following to minimize impacts on soils:

- minimize the quantity and duration of soil exposure;
- protect critical areas during construction by reducing the velocity of and redirecting runoff;
- install and maintain erosion and sediment control measures during construction;
- reestablish vegetation as soon as possible following final grading; and
- inspect and maintain erosion and sediment controls as necessary until final stabilization is achieved.

2.1 Compaction and Other Soil Impacts

During construction, topsoil and subsoil would be disturbed during grading and trenching activities and the movement of heavy equipment. The potential mixing of topsoil with the subsoil from these activities could result in a loss of soil fertility, which could potentially affect soils, including residential and agricultural soils. To prevent mixing of the soil horizons, topsoil segregation would be performed in agricultural lands that are annually cultivated or have crops rotated and in areas requested by the landowner or land managing agency. Transco would strip topsoil from the trench and subsoil storage area. The topsoil would be segregated and replaced in the proper order during backfilling and final grading. Implementation of proper topsoil segregation would help to ensure post-construction revegetation success, thereby minimizing loss of crop productivity and the potential for long-term erosion problems. Topsoil segregation would also minimize the introduction of subsoil rocks into agricultural topsoil, as further discussed below regarding shallow bedrock and rocky soils.

Construction equipment traveling over wet soils could disrupt the soil structure, reduce pore space, increase runoff potential, and cause rutting. The degree of compaction depends on the moisture content and soil texture. Fine-textured soils with poor internal drainage that are moist during construction are the most susceptible to compaction. Approximately 23 percent of the soils that would be affected by the Manassas Loop are considered prone to compaction. Transco would minimize compaction and rutting impacts during construction in soft or saturated soils by using measures outlined in the Project-specific E&SC Plan. Measures such as the use of low-ground-weight equipment and/or by temporary installation

of timber equipment mats may be used when soil moisture is high. Transco would test the topsoil and subsoil for compaction in all agricultural and residential areas disturbed by construction. Severely compacted agricultural areas would be mitigated with deep tillage operations during restoration activities using a paraplow or similar implement. In areas where topsoil is segregated, plowing with a paraplow or other deep tillage implement to alleviate subsoil compaction would be conducted before replacement of the topsoil. Soil compaction mitigation would also be performed in severely compacted residential areas.

The clearing and grading of soils with poor revegetation potential could result in a lack of adequate revegetation following construction and restoration of the right-of-way, which could lead to increased erosion, a reduction in wildlife habitat, and adverse visual impacts. None of the soils that would be affected by the Project are considered to have revegetation concerns. Transco would restore and revegetate according to the E&SC Plan, which includes specifications for applying soil amendments, working with local soil conservation authorities or other agencies to obtain seed mixture recommendations, and post-construction monitoring to ensure the effectiveness of revegetation and permanent erosion control devices during facility operation.

To minimize or prevent impacts due to soil erosion and off-right-of-way sedimentation during construction, Transco would utilize the erosion and sedimentation controls outlined in its Plan and Procedures and Project-specific E&SC Plan. Erosion control devices would be maintained until the right-of-way is successfully revegetated. Temporary erosion controls, including slope breakers and sediment barriers (e.g., hay bales and silt fences), would be installed following initial ground disturbance to control runoff and prevent sediment transport off the construction right-of-way. Temporary erosion controls would be maintained until the Project area is successfully revegetated. During construction, the effectiveness of these temporary erosion control devices would be monitored by Transco's EIs. Following successful revegetation of construction areas, temporary erosion control devices would be removed. Permanent erosion controls would be installed, as necessary, to ensure the successful restoration of the Project area. The effectiveness of revegetation and permanent erosion control devices would be monitored by operating personnel during the long-term operation and maintenance of the Project facilities in accordance with the provisions in the ECS. With the implementation of these measures, we conclude that impacts on soils would be adequately minimized.

2.2 Soil Contamination

An Environmental Data Resources, Inc. (EDR) database search report was acquired for the Project areas. Several sites within 0.25 mile of the Manassas Loop were identified with areas of possible soil contamination. However, based on the "closed" statuses and/or the types of releases, it is unlikely that contaminated soil associated with these sites would be encountered during construction of the Manassas Loop. Areas of historic soil contamination associated with leaking storage tanks were identified within the Station 165 property area. A comprehensive site-wide assessment and soil remediation was performed to remove these sources of contamination. Following the remediation and removal of all contamination, the VDEQ closed the leaking tank case in 2007. Additionally, Stations 175 and 130 were identified on their EDR reports with areas of historic soil and/or groundwater contamination. Transco indicated that it would work with federal and state agencies to develop appropriate avoidance and mitigation procedures if it were to encounter unanticipated contaminated soils during construction. In order to identify and implement any proposed procedures prior to construction activities, **we recommend that:**

- **Prior to construction, Transco should file with the Secretary of the Commission (Secretary) for review and written approval by the Director of the Office of Energy Projects (OEP), an Unanticipated Discovery of Contamination Plan to respond to**

potential soil and groundwater contamination encountered during construction of the Project.

At any of the Project sites, inadvertent spills or leaks of fuels, lubricants, or coolant from construction equipment could adversely affect soils. The impacts of such releases are typically minor because of the low frequency and small volumes of spills and leaks. Transco would implement the measures in its SPCC Plan in conjunction with the Project-specific E&SC Plan to prevent spills of any material that may contaminate soils, and to ensure that inadvertent spills are contained, cleaned up, and disposed of in an appropriate manner.

Given the proposed impact minimization and mitigation measures and our recommendation described above, we conclude that soils would not be significantly affected by Project construction and operation.

3.0 WATER RESOURCES AND WETLANDS

3.1 Groundwater Resources

Activities at the existing facilities in Virginia, South Carolina, Georgia, and Louisiana would be limited to previously disturbed areas within Transco's property boundary or maintained right-of-way. Based on the limited ground disturbance at these sites and the mitigation measures contained in Transco's Plan and Procedures and Project-specific E&SC Plan, the modifications at these facilities would result in minimal, temporary impact on groundwater and are not discussed further in this section, except for Station 165.

Aquifers

The Manassas Loop and Station 165 are in the Early Mesozoic Basin aquifer system which consists primarily of layers of consolidated sedimentary rock (e.g., siltstone, mudstone, and local beds of dolomite and coal), with sandstone deposits as the primary water producing units. Most of the groundwater in the formation occurs in and is transmitted through joints, fractures, and bedding planes due to compaction and cementation which reduces the primary pore space in the sandstone deposits. Average well yields within the Early Mesozoic Basin aquifer system are 2.1 million gallons per day (USGS, 2016a; USGS, 2016b).

Sole-Source Aquifers, Wellhead Protection Areas, and Groundwater Management Areas

Under Section 1424(e) of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) defines a sole or principal source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer, and for which there are no other reasonably available alternative drinking water source(s) that could physically, legally, and economically supply all those who depend on the aquifer for drinking water should the aquifer become contaminated. Neither the Manassas Loop nor Station 165 are within sole-source aquifers (EPA, 2018).

No wellhead protection areas or groundwater management areas have been identified in the vicinity of the Manassas Loop or Station 165 (VDEQ, 2018a).

Water Wells and Springs

Six private groundwater wells were identified within 150 feet of the Manassas Loop work areas, the closest of which is 55 feet from the Project work area near MP 1568.2. Forty-nine monitoring wells,

four commercial wells, and four formerly residential groundwater wells were identified within the Station 165 workspace. All of the wells are owned and controlled by Transco. No public groundwater wells were identified within 1 mile of the Manassas Loop or Station 165.

Groundwater Contamination

Separate EDR reports were acquired for the individual Project areas. Several sites within 0.25 mile of the Manassas Loop were identified with areas of possible groundwater contamination. However, based on the “closed” statuses and/or the types of releases, it is unlikely that contaminated groundwater associated with these sites would be encountered during construction of the Manassas Loop. Stations 165, 175, and 130 were also identified on their respective EDR reports and are discussed further in section B.2.2 – Soil Contamination.

Pipeline and related infrastructure construction necessitates the use of heavy equipment and associated fuels, lubricants, and other potentially hazardous substances that, if spilled, could affect shallow groundwater and/or aquifers. Accidental spills or leaks of hazardous materials associated with vehicle fueling, vehicle maintenance, and material storage would present the greatest potential contamination threat to groundwater resources. Soil contamination resulting from these spills or leaks could continue to add pollutants to the groundwater long after a spill had occurred.

Implementation of proper storage, containment, and handling procedures would effectively minimize the chance of such releases. Transco’s SPCC Plan and Project-specific E&SC Plan addresses preventative and mitigative measures that would be used to avoid or minimize the potential impacts of hazardous material spills during construction. Measures outlined in Transco’s Plan and Procedures, SPCC Plan, and Project-specific E&SC Plan include, but are not limited to:

- spill prevention and response training for construction personnel;
- regular inspection of construction equipment for leaks;
- prohibition of fueling and lubricating activities and hazardous material storage in or adjacent to sensitive areas;
- secondary containment for storage of fuels, oils, hazardous materials, and equipment;
- collection and disposal procedures for wastes generated during equipment maintenance;
- emergency response procedures; and
- standard procedures for excavation and offsite disposal of any soils contaminated by spillage.

We have reviewed Transco’s Plan and Procedures, SPCC Plan, and Project-specific E&SC Plan, and find that implementation of these plans adequately address the storage and transfer of fuels and hazardous materials as well as the response to be taken in the event of a spill.

Groundwater Impacts and Mitigation

Construction activities, including clearing, trench excavation, dewatering, and fuel handling, could affect groundwater in several ways. Clearing and grading would remove vegetation that provides filtration and slows surface runoff. Trenching and soil stockpiling activities would temporarily alter overland flow and groundwater recharge and could alter near-surface groundwater flows where shallow groundwater is encountered. Heavy equipment used for construction could compact the soil along the right-of-way and slow groundwater recharge rates. Shallow groundwater could also affect the buoyancy of the pipe, increase the potential for pipe corrosion, and cause sidewall instability during construction. In the event groundwater was to infiltrate into the excavated areas, dewatering could result in localized, minor changes in the water table. Effects from construction would likely be temporary, and the

groundwater system would recover to equilibrium within a period of days to a few months. Other groundwater impacts during construction would be effectively minimized or avoided by implementing construction practices outlined in Transco's Plan and Procedures, SPCC Plan, and Project-specific E&SC Plan.

In addition to the above construction practices, Transco would coordinate with well owners and offer pre- and post-construction testing in order to document water quality and flow for all active wells within 150 feet of Project areas. If testing revealed that impacts on a well occurred as a result of Project construction, Transco would coordinate with the well owner to provide a temporary source of water and repair or replace the impacted well.

3.2 Surface Water Resources

The Manassas Loop is in the Cedar Run-Owl Run and Kettle Run Watersheds (Hydrologic Use Codes[HUC] 12 - 020700100602 and 020700100503); Station 185 is in the Middle Bull Run Watershed (HUC 12 – 020700100703); Station 175 is in the Hardware River-Woodson Creek Watershed (HUC 12-020802031204); and Station 165 is within the Cherrystone Creek Watershed (HUC 12 - 030101050104).

The Manassas Loop would cross 20 waterbodies, including five perennial streams (Cedar Run, Kettle Run, Owl Run, South Run, and Walnut Branch) and one pond. No major waterbodies (i.e., waterbodies greater than 100 feet wide) would be crossed. Table 14 shows the waterbodies that would be affected by the Manassas Loop.

Transco proposes to cross waterbodies using a dry-ditch technique (dam-and-pump, which are described in section A.8.9 Waterbody Crossings, and figure 3), if water is flowing at the time of construction. If there is no water flowing, Transco would cross the stream bed using a standard open-cut crossing technique. Blasting, if required, would be conducted in accordance with the Project's Blasting Plan. Construction of the Manassas Loop is anticipated to take approximately 11 months during the spring, summer, and fall.

The Virginia antidegradation policy (VDEQ 2018b) uses a three tier approach to protect water quality as follows:

- Tier 1 – Specifies that existing instream water uses and the level of water quality to protect the existing uses shall be maintained and protected. At a minimum, all waters should meet adopted water quality standards.
- Tier 2 – Protects water that is better than specified water quality standards. Only in limited circumstances may water quality be lowered in these waters.
- Tier 3 – Exceptional waters where no new, additional or increased discharge of sewage, industrial wastes or other pollution are allowed. These waters must be specifically listed in the regulation.

All waterbodies crossed by the Manassas Loop are classified as Tier 1 and are designated for uses including recreation uses (swimming and boating); the propagation and growth of a balanced, indigenous population of aquatic life, including game fish, which might reasonably be anticipated to inhabit the waters; wildlife; and the production of edible and marketable natural resources (fish and shellfish) (9 Virginia Administrative Code (VAC) 25-260-10).

Table 14

Waterbodies Affected by the Southeastern Trail Project

Milepost	Waterbody Name	Flow Regime	Crossing Length (feet) ^a	FERC Classification	Sensitive Resource Water / Reason	Crossing Method ^b
Manassas Loop						
1568.1	Tributary to Owl Run	Ephemeral	--	Minor	No	Within Construction Workspace
1568.1	Tributary to Owl Run	Perennial	--	Minor	No	Within Construction Workspace
1568.2	Tributary to Owl Run	Ephemeral	1	Minor	No	Dam and Pump
1568.4	Owl Run	Perennial	34	Intermediate	303(d)	Dam and Pump
1568.7	Tributary to Owl Run	Intermittent	6	Minor	No	Dam and Pump
1569.1	Tributary to Owl Run	Ephemeral	2	Minor	No	Dam and Pump
1569.8	Cedar Run	Perennial	43	Intermediate	303(d)	Dam and Pump
1569.8	Tributary to Cedar Run	Intermittent	20	Intermediate	No	Dam and Pump
1570.4	Tributary to Cedar Run	Perennial	5	Minor	No	Dam and Pump
1570.4	Tributary to Cedar Run	Intermittent	5	Minor	No	Dam and Pump
1570.6	Tributary to Cedar Run	Ephemeral	5	Minor	No	Dam and Pump
1571.7	Tributary to Cedar Run	Intermittent	--	Minor	No	Within Construction Workspace
1571.8	Walnut Branch	Perennial	13	Intermediate	No	Dam and Pump
1572.1	Unnamed Drainage	Ephemeral	1	Minor	No	Dam and Pump
1572.2	Tributary to Walnut Branch	Ephemeral	2	Minor	No	Dam and Pump
1572.3	Tributary to Walnut Branch	Ephemeral	2	Minor	No	Dam and Pump
1572.5	Tributary to Walnut Branch	Ephemeral	2	Minor	No	Dam and Pump
1572.7	Tributary to Walnut Branch	Perennial	7	Minor	No	Dam and Pump
1573.8	Tributary to South Run	Ephemeral	--	Minor	No	Within Construction Workspace
1573.9	Tributary to South Run	Perennial	17	Intermediate	No	Dam and Pump
1574.2	Unnamed Pond	N/A (Pond)	75	Intermediate	No	Dam and Pump
1574.7	Tributary to South Run	Perennial	16	Intermediate	No	Dam and Pump
1574.7	South Run	Perennial	28	Intermediate	303(d) VDCR SCU ^c	Dam and Pump
1575.6	Tributary to South Run	Intermittent	3	Minor	No	Dam and Pump
Access Roads						

Table 14						
Waterbodies Affected by the Southeastern Trail Project						
Milepost	Waterbody Name	Flow Regime	Crossing Length (feet) ^a	FERC Classification	Sensitive Resource Water / Reason	Crossing Method ^b
Manassas Loop						
SAR1568.7	Tributary to Owl Run	Ephemeral	4	Minor	No	Existing Culvert
SAR1571.32	Tributary to Cedar Run	Intermittent	--	Minor	No	Adjacent to Existing Road
Contractor Yard/Staging Area						
1572.1	Tributary to Dry Creek	Ephemeral	--	Minor		Within contractor yard
1572.1	Tributary to Dry Creek	Ephemeral	--	Minor		Within contractor yard
Total^a		Ephemeral	19			
		Intermittent	33			
		Perennial	164			
		Total	216			
a - Crossing length is calculated based on the surveyed top-of-bank to top-of-bank stream width. b - Dam and pump crossings would be performed in those waterbodies with perceivable flow conditions at the time of construction. c- Virginia Department of Conservation and Recreation Stream Conservation Unit						

As part of state water quality assessments, Section 303(d) of the Clean Water Act mandates that states must also prepare a list of all waters that do not meet the water quality criteria for their designated uses, and develop for each a Total Maximum Daily Load (TMDL), which establishes the maximum allowable discharge into a waterbody to better control for pollutant levels. Category 4 includes waterbodies where TMDLs have been completed or cannot be completed due to the nature of the contamination. Category 5 includes waterbodies where TMDLs need to be developed by the state.

According to the Draft 2016 305(b)/303(d) Water Quality Assessment Integrated Report (VDEQ 2017), Owl Run, Cedar Run, South Run, and Kettle Run are classified as impaired. Owl Run, Cedar Run, South Run, and Kettle Run are all listed as Category 4A — impaired due to *Escherichia coli* (E. coli), with sources listed as grazing in riparian or shoreline zones, manure runoff, waterfowl, and wildlife other than waterfowl. TMDL development for Owl Run is scheduled by 2026. TMDLs for various reaches of Cedar Run were developed in 2004. TMDLs are scheduled for development in 2024 for South Run and 2026 for Kettle Run (VDEQ 2017). Pipeline construction is not considered to be a source of E. coli or contributing factor to further degradation of these waterbodies. Kettle Run and South Run, are part of the Virginia Department of Conservation and Recreation – Natural Heritage Project (VDCR-DNH) designated Kettle Run Stream Conservation Unit (SCU) (VDCR-DNH 2018a) and contain fisheries of special concern (see section B.4.3).

No potable water intakes are known within three miles upstream of any waterbody crossing. Additionally, no Virginia Scenic Rivers (VDCR-NHD 2018b), Nationwide Rivers Inventory (NPS 2018), or National Wild and Scenic Rivers segments (Rivers 2018) are crossed or are located within 0.3 mile of the Manassas Loop.

Aboveground Facilities

Project activities at Stations 185 and 175 would be limited to previously disturbed areas at the existing stations, and therefore would not affect any waterbodies.

At Station 165, one perennial stream and three intermittent streams, all tributaries to Cherrystone Creek, are present. However, Project activities are more than 150 feet from these streams, and therefore would not impact these waterbodies.

Project activities for the mainline facility station reversals and deodorization modifications, and the mainline valve deodorization modifications would not affect any surface waterbodies, as all Project activities would be limited to previously disturbed areas within Transco's existing facilities.

Floodplains

The Manassas Loop crosses approximately 1,721 feet of Federal Emergency Management Agency (FEMA) Flood Zone A and 2,041 feet of FEMA Flood Zone AE (FEMA 2018). FEMA Flood Zone A are locations with a 1-percent annual chance of flooding (also known as the 100-year floodplain) and Zone AE are where predicted flood water elevations above mean sea level have been established (FEMA 2018). The majority of the Manassas Loop route (91 percent) is not in a designated flood zone (areas designated X) (FEMA 2018).

No designated FEMA Flood Zones are located within the Station 185, 175, or 165 sites (FEMA 2018).

Across the Project areas, Transco would implement its BMPs for construction and restoration, which would avoid, minimize, and/or mitigate impacts on the Project area, including the following:

- limiting the amount of vegetation cleared during construction to the minimum amount necessary for safe construction;
- controlling of erosion and sedimentation through installation of appropriate erosion and sedimentation facilities within and at the limits of the Project workspace; and
- maintaining erosion control devices post-construction to ensure successful revegetation of the construction area.

Restoration and revegetation of temporarily impacted areas would comply with Transco's Plan and Procedures, as well as state and federal regulations and monitoring requirements. Areas of temporary construction workspace would be restored to pre-construction contours after construction, which is not anticipated to result in increased flood elevations or encroachment within floodways.

Hydrostatic Testing

Transco would hydrostatically test all pipelines in accordance with USDOT pipeline safety regulations. Hydrostatic testing involves filling the pipeline facilities with water and pressurizing the pipeline facilities above their maximum allowable operating pressure. The pressure in the facilities is then monitored for several hours. If a drop in pressure is recorded, then the pipeline facilities would be examined to determine if any leaks have occurred. Table 15 indicates the facility and approximate water volume required for testing.

Hydrostatic test water would be sourced from municipal sources and discharged at the respective Project sites. Transco would discharge the water used for hydrostatic testing in an upland area in a

controlled manner and through the proper structures in accordance with the Transco Procedures, such as hay/straw bales, before discharging it into a well-vegetated, upland area and directing it to the original water basin. The discharge through the dissipation device and upland area would minimize erosion. Transco would follow the measures contained in its Procedures and all applicable federal, state, and local regulations. Hydrostatic test water would be sampled prior to discharge to manage effluents in accordance with the guidance provided in Virginia 9VAC25-120- 80 General Permit No. VAG83. Based on the primary water source being a municipal source, Transco anticipates that the hydrostatic test water would have to be treated to bring chlorine concentrations below the permissible limits provided within VAG83. Transco would manage chlorine content with Vita-D-Chlor or equivalent in a sufficient quantity to meet water discharge quality stipulations.

For the reasons discussed above, we conclude that the hydrostatic testing of the Project would not have a significant impact on water resources.

Table 15		
Proposed Hydrostatic Test Water Source		
Facility	County, State	Estimated Volume (gallons)
Manassas Loop	Fauquier, Virginia	3.1 million
Station 185	Prince William, Virginia	none required
Station 175	Fluvanna, Virginia	138,000
Station 165	Pittsylvania, Virginia	400,000
Station 65	St. Helena Parish, Louisiana	66,000
Station 140	Spartanburg County, South Carolina	95,000
Station 130	Madison County, Georgia	114,000
Station 115	Coweta County, Georgia	130,000
Station 116	Carroll County, Georgia	250
Station 120	Henry County, Georgia	2,500
Station 125	Walton County, Georgia	1,500
Station 135	Anderson County, South Carolina	2,500
Total		949,750

Waterbody Construction and Mitigation Procedures

Construction at aboveground and pipeline facilities would result in some minor, temporary impacts on surface waterbodies crossed by the Project. Transco proposes to use a dry, open-cut waterbody crossing method (dam and pump) for the Manassas Loop.

Impacts could occur as a result of in-stream construction activities or construction activities along the banks and slopes adjacent to streams. Aquatic habitat modification, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, release of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants such as fuel or lubricants could result from clearing and grading stream banks, in-stream trenching, trench dewatering, backfilling, or heavy machinery operation, storage, or refueling. Transco would implement measures contained in its Procedures to minimize adverse impacts on surface waterbodies.

Transco would also maintain compliance with all applicable federal, state, and local regulations and permits. Measures designed to minimize the effects of erosion and impacts on waterbodies and downstream resources include:

- once pipe has been placed into a trench, immediate replacement of excavated material and restoration of stream banks and stream beds to pre-construction contours to the maximum extent practicable;
- revegetation of stream banks and riparian areas in accordance with Transco's Plan and Procedures and the Project-specific E&SC Plan; and
- storage of hazardous materials, chemicals, lubricating oils, and fuels used during construction no less than 100 feet from surface waterbodies or wetlands as outlined in Transco's SPCC Plan and its Procedures.

With the implementation of Transco's SPCC and E&SC Plan, the FERC Plan and Procedures, and measures required in waterbody construction permits, impacts on waterbodies would be sufficiently minimized.

3.3 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and normally do support, a prevalence of wetland vegetation adapted for life in saturated soil conditions. Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing habitat for wildlife, recreational opportunities, flood control, and for naturally improving water quality.

Wetlands that would be affected by the Project are regulated at the federal and state levels. On the federal level, the U.S. Army Corps of Engineers (USACE) has authority under Section 404 of the Clean Water Act to review and issue permits for activities that would result in the discharge of dredge or fill material into waters of the United States, including wetlands. Section 401 of the Clean Water Act requires that proposed dredge or fill activities under Section 404 be reviewed and certified by the designated state agency (in this case, the VDEQ to ensure that the Project would meet state water quality standards.

Transco performed field wetland delineations in January, February, and August 2018. Transco did not conduct environmental field surveys at Stations 185, Mainline Facility Station Reversals and Deodorization Modifications sites, or Mainline Valve Deodorization Modifications sites as Project activities at these sites would occur in previously disturbed areas within the existing facilities.

The Manassas Loop would temporarily impact 2.0 acres of wetlands (1.0 acres of palustrine emergent [PEM] and 1.0 acre of palustrine forest [PFO]). Pipeline operations would permanently convert 0.4 acre of PFO to PEM (see table 16). Transco has stated that aboveground facilities, including Stations 185, 175, and 165, the mainline facility station reversals and deodorization modifications, and the mainline valve deodorization modifications would not impact wetlands. Descriptions of the wetlands habitat the Manassas Loop would impact are discussed in table 16 and below.

Table 16						
Wetlands Affected by the Southeastern Trail Project						
MP	Cowardin Classification ^a	County	Quality	Approximate Centerline Crossing Length (feet)	Temporary Construction Impact ^b (acres)	Permanent ROW Impact ^b (acres)
Manassas Loop						
1568.4	PFO	Fauquier	Moderate	Within construction workspace	<0.1	0.00
1568.7	PEM	Fauquier	Moderate	26	0.1	<0.1
1568.7	PFO	Fauquier	Moderate	Within construction workspace	<0.1	0
1569.8	PEM	Fauquier	Low	312	0.2	<0.1
1569.8	PFO	Fauquier	Moderate	Within construction workspace	0.3	0.2
1569.9	PEM	Fauquier	Low	Within construction workspace	<0.1	0
1569.9	PFO	Fauquier	Moderate	Within construction workspace	<0.1	0
1569.9	PEM	Fauquier	Low	194	0.2	<0.1
1570.1	PFO	Fauquier	Moderate	Within construction workspace	<0.1	<0.1
1570.1	PEM	Fauquier	Low	101	0.1	0.1
1570.4	PEM	Fauquier	Low	138	0.1	<0.1
1570.4	PFO	Fauquier	Moderate	Within construction workspace	0.2	0.1
1571.1	PFO	Fauquier	Moderate	Within construction workspace	<0.1	0
1573.9	PEM	Prince William	Low	Within construction workspace	0.2	0
1573.9	PFO	Prince William	Moderate	225	0.3	0.1
1574.2	PEM	Prince William	Low	Within construction workspace	<0.1	0
1574.8	PEM	Prince William	Low	69	0.1	<0.1
1575.6	PFO	Prince William	Low	Within construction workspace	0.1	0.1
1575.6	PEM	Prince William	Low	106	<0.1	<0.1

Wetlands Affected by the Southeastern Trail Project						
MP	Cowardin Classification^a	County	Quality	Approximate Centerline Crossing Length (feet)	Temporary Construction Impact^b (acres)	Permanent ROW Impact^b (acres)
			Total	1,171	2.0	0.6
			PEM	946	1.0	0.2
			PFO	225	1.0	0.4
<small>a - Designations for each type of wetland follow the classifications developed by the FWS after Cowardin et al. (1979). b - Actual values were used to calculate sums, but table values and sums were rounded so may not reflect precise totals.</small>						

Palustrine Forest Wetlands — PFO wetlands are characterized by woody vegetation that is 6 meters (approximately 20 feet) tall or taller and normally include an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer (Cowardin et al. 1979). The most common type of forested wetland crossed by the Project are wetland hardwood forests, which have a closed canopy comprised of the following species: red maple, boxelder maple, American sycamore, slippery elm, American elm, swamp Spanish oak, and red cedar.

Palustrine Emergent Wetlands — PEM wetlands are non-tidal wetlands characterized by erect, rooted, herbaceous hydrophytes, excluding mosses, and lichens. This vegetation is present for most of the growing season in most years. PEM wetlands typically are dominated by perennial plants (Cowardin et al. 1979). Emergent wetlands identified in the Project area include wet meadows, sedge meadows, and few freshwater marshes, located on landforms including riverine floodplains, flats, slopes, and depressions. In the Project area, emergent wetlands typically include soft rush, prairie cordgrass, rough cocklebur, cattail, yankeeweed, bristly dewberry, shallow sedge, fragrant flatsedge, Canada goldenrod, rice button aster, small geranium, watercress, broomsedge bluestem, fall panicgrass, red fescue, and seedbox.

In accordance with Transco’s Procedures, topsoil would be segregated in unsaturated wetlands in the area of the trenchline. In saturated wetlands where soils are unstable, temporary work surfaces of timber mats or gravel on geotextile fabric would be installed adjacent to the pipeline trench. Construction would proceed in saturated wetlands, except topsoil would not be segregated due to the saturated, unconsolidated conditions. Pipe stringing and fabrication may take place within the wetland adjacent to the trench, or adjacent to the wetland in a designated ATWS.

Typical measures to minimize impacts on wetlands include limiting the amount of equipment and use of ATWS in and adjacent to wetlands, restoring wetland contours, and conducting follow-up monitoring to ensure each wetland becomes re-established successfully. Transco would also follow all applicable federal, state, and local regulations regarding wetland impacts and follow BMPs outlined in its E&SC Plan. Most of the wetlands impacted by the Project would be restored and allowed to revert to pre-existing conditions after construction is complete. As allowable under the FERC Procedures, a corridor centered on the pipeline up to 10 feet wide in all wetlands would be maintained in an herbaceous state. No permanent impacts would occur to PEM wetlands given they would be restored to their previous state once construction is complete. For PFO wetlands, a 30-foot corridor centered on the pipeline would be maintained, and trees within 15 feet of the pipeline with roots that could compromise the integrity of pipeline coating would be selectively removed. This would result in a permanent conversion to PEM wetland. Mitigation for permanent conversion of wetland vegetation cover would be determined through

consultation with the USACE.

Transco has stated that although wetlands occur within the workspace of Station 175, none would be impacted. However, Transco has not provided a figure that indicates the extent of the temporary workspace at Station 175 or the distance between the wetlands and the temporary workspace. In order to confirm that no wetlands would be impacted at Station 175 and provide the configuration of permanent and temporary workspace with regard to nearby wetland and waterbody resources, **we recommend that:**

- **Prior to construction, Transco should file with the Secretary the following regarding Station 175:**
 - a) **a current aerial figure that indicates the extent of temporary workspaces, all wetlands and waterbody boundaries, and permanent workspaces; and**
 - b) **Best Management Practices drawings indicating the distance between the wetlands and the temporary workspace and how Transco will protect the wetlands, for review and written approval by the Director of OEP.**

Given Transco's commitment to the measures identified in its Plan, Procedures, SPCC Plan, and E&SC Plan, our recommendation, and its adherence to other relevant permits, impacts on wetlands during construction and operation would be sufficiently minimized.

4.0 VEGETATION, WILDLIFE, AND FISHERIES

4.1 Vegetation

The Manassas Loop portion of the Project area contains forest, wetlands, agricultural land, open space, and developed land. At Station 185 and Station 175, no vegetation is present. At Station 165, vegetation communities include mixed hardwood, planted pine, and upland herbaceous. Wetland and waterbodies, although present, would not be impacted by construction at Station 165. Table 17 indicates the vegetation types and amounts crossed by the Project.

Forest

Upland forest communities include mixed hardwood forest, pine forest, and planted pine. Mixed hardwood forest is characterized by trees generally greater than 15 feet tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species comprise more than 75 percent of total tree cover. Upland mixed hardwood forests are well-developed with a partially-closed canopy. Typical species within these upland forest communities include red maple (*Acer rubrum*), pignut hickory (*Carya glabra*), mockernut hickory (*Carya tomentosa*), white oak (*Quercus alba*), American beech (*Fagus grandifolia*), tulip poplar (*Liriodendron tulipifera*), loblolly pine (*Pinus taeda*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), and red elm (*Ulmus rubra*). Common understory and shrub species within these communities include Chinese privet (*Ligustrum sinense*), red mulberry (*Morus rubra*), common blackberry (*Rubus argutus*), and American witchhazel (*Hammamelis virginiana*). Herbaceous grass and forb species include nodding fescue (*Festuca subverticillata*) and stiltgrass (*Microstegium vimineum*). Pine forests consists of areas dominated by pine trees generally greater than 15 feet tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves year-round and the canopy is never without green foliage. Common species observed include shortleaf pine (*Pinus echinata*), slash pine (*Pinus elliottii*), loblolly pine, red cedar (*Juniperus virginiana*), eastern hemlock (*Tsuga canadensis*), and American holly (*Ilex opaca*). Planted pine plantations typically consisted of southern yellow pine species, most dominated by loblolly pine (*Pinus taeda*).

Wetlands

Forested Wetlands

The most common type of palustrine forested wetland crossed by the Project are wetland hardwood forests, which have a closed canopy comprised of the following species: red maple (*Acer rubrum*), boxelder maple (*Acer negundo*), American sycamore (*Platanus occidentalis*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), swamp Spanish oak (*Quercus palustris*), and red cedar.

Emergent Wetlands

Palustrine emergent wetlands identified in the Project area include wet meadows, sedge meadows, and few freshwater marshes, located on landforms including riverine floodplains, flats, slopes, and depressions. In the Project area, emergent wetlands typically include soft rush (*Juncus effusus*), prairie cordgrass (*Spartina pectinata*), rough cocklebur (*Xanthium strumarium*), cattail (*Typha latifolia*), yankeeweed (*Eupatorium compositifolium*), bristly dewberry (*Rubus hispidus*), shallow sedge (*Carex lurida*), fragrant flatsedge (*Cyperus odoratus*), Canada goldenrod (*Solidago canadensis*), rice button aster (*Symphyotrichum dumosum* var. *dumosum*), small geranium (*Geranium pusillum*), watercress (*Nasturtium officinale*), broomsedge bluestem (*Andropogon virginicus*), fall panicgrass (*Panicum dichotomiflorum*), red fescue (*Festuca rubra*), and seedbox (*Ludwigia alternifolia*).

Agricultural land

Crops that are commonly cultivated in the Project area include corn, sorghum, wheat, and soybeans (Virginia Places 2018a). Hay fields in Virginia are cultivated to grow a variety of perennials grasses, including fescue, orchardgrass, timothy, plus clover, and other forbs (Virginia Places 2018b).

Open Land

Non-agricultural open space communities include **upland herbaceous** and **upland scrub-shrub** areas such as maintained roadway and transmission rights-of-way, as well as fallow fields and maintained residential lawns. The level of maintenance generally determines the species composition in these communities. Periodically maintained transmission rights-of-way include a higher content of shrub species such as common blackberry and Chinese privet along with juvenile species of loblolly pine, winged elm (*Ulmus alata*), white oak, and winged sumac (*Rhus copallinum*). Common herbaceous grass and forb species include: nodding fescue (*Festuca subverticillata*), red fescue (*Festuca rubra*), dallisgrass (*Paspalum dilatatum*), little bluestem (*Schizachyrium scoparium*), white goldenrod (*Solidago bicolor*), Canada goldenrod (*Solidago canadensis*), deertongue (*Dichanthelium clandestinum*), dogfennel (*Eupatorium capillifolium*), and lespedeza (*Lespedeza cuneata*). Typical pasture herbaceous species include red fescue, broomsedge (*Andropogon virginicus*), wingstem (*Verbesina alternifolia*), lespedeza, annual ragweed (*Ambrosia artemisiifolia*), Canada goldenrod, Queen Anne's lace (*Daucus carota*), and dogfennel.

Developed Land

Developed land includes medium-intensity developed and low-intensity developed areas. Areas with a mixture of constructed materials and vegetation and impervious surfaces that account for 50 percent to 79 percent of the total cover are considered to be medium-intensity developed areas. These areas most commonly include single-family housing units and pipeline facilities. Low-intensity developed areas include areas with a mixture of constructed materials and vegetation, where impervious surfaces account for 20 to 49 percent of total cover. These areas also commonly include single-family housing units or farm areas. In these areas, vegetation may account for 20 to 70 percent of land cover. Vegetation

Table 17

Vegetation Types Crossed by the Southeastern Trail Project (acres)

Facility	Agricultural		Cultivated Crops		Hay/Pasture		Upland Forest		Mixed Hardwood		Pine Forest		Planted Pine		Upland Shrub		Upland Herbaceous		Wetlands		Emergent		Forested		Open Water		Non-Vegetative		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
	Pipeline																														
Manassas Loop	66.7	15.7	15.7	3.8	51.0	11.9	17.4	5.4	15.1	4.6	2.3	0.8	0.0	0.0	2.1	0.3	9.8	2.4	2.0	0.6	1.0	0.2	1.0	0.4	0.7	0.2	1.9	0.5	100.7	25.2	
Additional Temporary Workspace	32.1	0.0	11.7	0.0	20.5	0.0	4.7	0.0	3.5	0.0	1.1	0.0	0.1	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	42.1	0.0	
Access Roads	0.9	0.0	0.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.1	1.9	0.2
Contractor Yard	51.6	0.0	50.3	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.3	0.0	54.9	0.0
Pipeline Subtotal	151.3	15.7	78.0	3.8	73.4	11.9	22.1	5.4	18.6	4.6	3.4	0.8	0.1	0.0	2.1	0.3	14.5	2.5	2.0	0.6	1.0	0.2	1.0	0.4	0.7	0.2	6.8	0.6	199.6	25.4	
Compressor Stations																															
Station 185	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Station 175	0.0	0.0	0.0	0.0	0.0	0.0	2.7 ^a	0.0	0.0	0.0	0.0	0.0	0.0	2.7 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	32.2	7.0	35.8	7.2
Station 165	0.0	0.0	0.0	0.0	0.0	0.0	26.3	7.1	10.5	0.0	0.0	0.0	15.8	7.1	0.0	0.0	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	2.9	82.1	10.0
Compressor Stations Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	29.0	7.1	10.5	0.0	0.0	0.0	18.5	7.1	0.0	0.0	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	78.1	9.9	117.9	17.2	
Mainline Facility Station Reversals and Deodorization Modifications																															
Station 65	0.0	0.0	0.0	0.0	0.0	0.0	0.5 ^a	0.0	0.5 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	27.5	0.0
Station 140	0.0	0.0	0.0	0.0	0.0	0.0	0.3 ^a	0.0	0.3 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.3	0.0	28.6	0.0
Station 130	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0	24.8	0.0
Station 115	0.0	0.0	0.0	0.0	0.0	0.0	9.5 ^a	0.0	9.5 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	32.8	0.0	42.3	0.0
Station 116	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	0.0	8.7	0.0
Station 120	0.0	0.0	0.0	0.0	0.0	0.0	4.3 ^a	0.0	4.3 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.2	0.0	24.5	0.0
Station 125	0.0	0.0	0.0	0.0	0.0	0.0	0.7 ^a	0.0	0.7 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0	10.7	0.0
Station 135	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	9.3	0.0
Mainline Facility Station Reversals and Deodorization Modifications Subtotals	0.0	0.0	0.0	0.0	0.0	0.0	15.3	0.0	15.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	161.1	0.0	176.4	0.0

Table 17 (continued)

Vegetation Types Crossed by the Southeastern Trail Project (acres)

Facility	Agricultural		Cultivated Crops		Hay/Pasture		Upland Forest		Mixed Hardwood		Pine Forest		Planted Pine		Upland Shrub		Upland Herbaceous		Wetlands		Emergent		Forested		Open Water		Non-Vegetative		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
	Mainline Valve Deodorization Modifications																														
MLV 115-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
MLF 115-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	
MLV 120-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0		
MLV 120-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0		
MLV 125-10	0.0	0.0	0.0	0.0	0.0	0.0	0.2 ^a	0.0	0.2 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0		
MLV 125-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0			
MLV 130-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7	0.0	
North Georgia Lateral Interconnect ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Savannah River Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	3.9	0.0	
MLV 130-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0			
MLV 135-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0			
MLV 135-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0			
Elba Express Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0			
Mainline Valve Deodorization Modifications Subtotal	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	0.0	14.7	0.0		
Total Impacts	151.3	15.7	78.0	3.8	73.4	11.9	66.6	12.5	44.6	4.6	3.4	0.8	18.6	7.1	2.1	0.3	34.3	2.5	2.0	0.6	1.0	0.2	1.0	0.4	1.1	0.4	250.6	10.5	508.6	42.6	

a - Trees occur within the limits of disturbance, but Transco would not remove these trees during Project construction.

b - See Station 125

typically consists of a mixture of deciduous, coniferous, and evergreen trees; ornamental trees and shrubs; planted grasses; and other groundcover.

Non-Native Invasive Species

Invasive species are species that grow and spread rapidly compared to native species, becoming established over large areas (USDA 2014). Exotic species have generally been introduced from another region of the U.S. or another continent. The U.S. Fish and Wildlife Service (FWS) defines invasive species as “organisms that are introduced into a non-native ecosystem and which cause, or are likely to cause, harm to the economy, environment or human health” (FWS 2012). Invasive plant species can change or degrade natural vegetation communities, which can reduce the quality of habitat for wildlife and native plant species.

During field surveys, Chinese privet and Japanese honeysuckle (*Lonicera japonica*) were noted within the Project study area. These species were not prolific and typically observed in areas at the edge of the existing right-of-way transitioning into forested environments.

A list of noxious weeds that could potentially occur in Project area is included in Transco’s Noxious and Invasive Weed Control Plan.⁹ Under this plan, Transco’s EI would identify and flag areas of concern while in the field to alert construction personnel and prevent access into areas until noxious and/or invasive weed management control measures have been implemented. Measures required by the Noxious and Invasive Weed Control Plan include contractors ensuring that work vehicles arrive at the site clean and weed-free, and using compressed air or other means to remove soil and propagules from machinery and vehicles to prevent their transport to other sections of the right-of-way. We have reviewed this plan and find it acceptable.

Transco would also implement the strategies outlined in NRCS Practice Standard 327 and would use seed mixes described in the 2014 Virginia Plant Establishment Guide, which includes a suggested seed mixture appropriate for the Project location, and would promote use of the Project right-of-way by pollinators with the exception of land in current agricultural practice and to satisfy specific landowner requests.

Construction and Operation Impacts and Mitigation

No specific vegetation types of special concern were identified by Transco or state and federal agencies that would be affected by the Project. However, the Nokesville Diabase Flatwoods Conservation Site was identified by VDCR as occurring within two miles of the Manassas Loop. Sensitive species such as hairy hedge-nettle (*Stachys arenicola*), stiff goldenrod (*Solidago rigida* var. *rigida*), and American bluehearts (*Buchnera Americana*) occur in this area. However, no impacts from the Project would occur to this area.

Following construction of the pipeline, the right-of-way would be restored to pre-construction condition per Transco’s Plan and E&SC Plan. The temporary right-of-way and ATWS areas used during construction (other than areas already existing as gravel or pavement), would be seeded and allowed to revegetate, with no further routine maintenance or disturbance associated with operation of the Project. Transco would maintain its 50-foot-wide permanent right-of-way per its Plan. Transco would monitor the Project area for two growing seasons to determine post-construction revegetation. Post-construction

⁹ Transco’s Noxious and Invasive Weed Control Plan was filed on April 11, 2018 as Appendix II.J of Transco’s Project application and can be found by navigating to elibrary.ferc.gov and entering accession number 20180411-5132(32818484).

maintenance, right-of-way monitoring, restoration, and revegetation in affected wetlands would be performed in accordance with its Procedures.

Timber would be removed only when necessary for construction purposes. Merchantable timber may be limbed, cut, and removed from the right-of-way. Timber that is not merchantable and other vegetative debris may be chipped, burned, or disposed of according to applicable regulations. Although Transco's preferred method of handling woody debris and other cut vegetation (slash) on the right-of-way during pipeline construction would be to stockpile and redistribute the material on the right-of-way, we have added a recommendation below so that Transco follows the construction debris disposal and beneficial reuse requirements in its Plan (sections III.E and V.A.6). Burning, if used, would be conducted in accordance with state and local burn permits and regulations and performed in a manner to minimize fire hazard and prevent heat damage to surrounding vegetation. Transco does not know exact locations, times, and amounts of prescribed open burning. Stumps and other timber considered non-merchantable may be used to construct off-road vehicle barriers at the request of landowners. Materials would be disposed of at commercial facilities or at other approved locations.

Permanent conversion of forested wetlands would be limited to less than one acre, for which mitigation is proposed (see section B.3.3, wetlands). Clearing for construction of the pipeline would not result in permanent effects to other wetland vegetation communities located outside of the permanent right-of-way and other maintenance areas. These wetlands would be allowed to revegetate naturally following construction. Routine vegetation management within wetland areas would not be conducted over the full width of the permanent right-of-way. In wetlands, a 10-foot-wide corridor centered on the pipeline would be maintained in an herbaceous state and trees located within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating would be cut and removed from the permanent right-of-way, in accordance with Transco's Procedures.

Routine maintenance of the right-of-way would be required to allow continued access for routine pipeline maintenance access for emergency repairs, and visibility during aerial patrols. In upland areas, maintenance of the right-of-way would involve clearing the entire 50-foot-wide permanent right-of-way of woody vegetation. As such, the maintained permanent rights-of-way would be subjected to mowing every few years. This maintenance would result in permanent conversion of some areas of existing upland forested vegetation to herbaceous or scrub-shrub vegetation. To minimize impacts on forested vegetation, Transco has routed the pipeline facilities adjacent to and within existing utility rights-of-way and road corridors to the extent possible, to the extent practicable. To facilitate periodic corrosion surveys, a 10-foot-wide strip centered on the pipeline would be mowed annually. Transco would not apply herbicides for general right-of-way maintenance.

Transco has stated it would prefer to stockpile vegetative debris and redistribute the material on the right-of-way. Transco also has stated it would like to bury stumps in non-tilled land on the construction work area, with the agreement of the appropriate landowner. However, Transco's Plan (section III.E and V.A.6) requires that vegetative debris must not result in an adverse environmental impact, and must be disposed of in a manner that would be considered beneficial reuse, or removed. The Plan also does not allow the burying of construction debris. Therefore, **we recommend that:**

- **Prior to construction, Transco should determine disposal methods for vegetative debris that comply with its Plan (section III.E and V.A.6), and file these plans with the Secretary for review and written approval by the Director of OEP.**

Construction of the Project would include temporary and permanent effects to vegetation. Construction of the Manassas Loop within existing rights-of-way would limit effects to vegetation in these areas by reducing land use change, tree clearing, and stump removal activities associated with the

construction of the Project. Given construction and mitigation of the Project facilities would be performed in accordance with Transco's Plan, Transco's Procedures, Transco's National Pollution Discharge Elimination System permit, and the Noxious and Invasive Weed Control Plan, impacts on vegetation would be sufficiently minimized and not significant.

4.2 Wildlife

The Project area consists of upland forests, upland scrub, upland herbaceous lands, open lands, agricultural lands, developed lands, and wetlands. Common wildlife and habitat types found in the Project area are presented in table 3 of appendix C. Potential impacts on wildlife include habitat removal and construction-related ground disturbance and noise. Some individual animals may be inadvertently injured or killed by construction equipment. However, more mobile species such as birds and mammals would likely relocate to other nearby suitable habitat to avoid the Project area once construction activities commence.

Two sensitive habitats were identified in the Project area that could be impacted by construction – Kettle Run Stream Conservation Unit (SCU), and Transco Road Net Conservation Site.

The Project crosses 2.7 acres of designated Resource Protection Areas adjacent to Kettle Run and South Run. Kettle Run SCU, which consists of Kettle Run and South Run, has a biodiversity ranking of B3, which represents a site of high significance, because it contains habitat for sensitive aquatic species. Kettle Run SCU contains two sensitive aquatic natural communities - the Middle Potomac Anacostia Occuquan Third Order Stream, and the Middle Potomac Anacostia Occuquan Fourth Order Stream. As table 14 indicates, Transco would not cross Kettle Run but would cross South Run at mileposts 1574.0 and 1575.5 using dam and pump crossing methods. Transco completed surveys for rare, threatened, and endangered species in South Run and none were identified. Transco would minimize impacts on South Run by the implementation of measures in its Procedures (see section B.3.2 for further discussion). Per recommendations by the VDCR letter dated January 18, 2018, Transco would construct the Project in accordance with BMPs outlined in its E&SC Plan and with all federal and state regulations and permit requirements including stormwater permit requirements to minimize effects at waterbody crossings during Project construction. Transco also completed consultation with Prince William County on April 25, 2018. Prince William County confirmed that the Project was considered an exempt activity and does not require any permit for the encroachment into the Resource Protection Areas. Transco has stated it would continue to consult with the Virginia Department of Game and Fish (VDGIF) and the FWS to determine any additional minimization measures needed near Kettle Run SCU.

The Transco Road Net Conservation site is an area of concern for the tricolored bat and contains summer roosting habitat for the species. The Transco Road Net Conservation Site occurs within an area of managed planted pine at Station 165. Approximately 15.8 acres of this area would be cleared during construction, and of that 7.1 acres would be permanently impacted. A tri-color bat was documented at the site in 2015. Although bats may be traveling through areas of planted pine, the VDGIF stated in its letter dated August 28, 2018 that no roosting sites or hibernacula have been identified near the Project site, and they do not anticipate the Project having a significant impact on the species. The VDGIF brown bat and tri-colored bat Habitat Application online viewer tracks known hibernacula and known roost trees for these species. As of July 16, 2018, there are no known hibernacula or known roost trees near Station 165. Transco intends to comply with the VDGIF Guidance Document on Best Management Practices for Conservation of Little Brown Bats and Tri-Color Bats. It would also restrict clearing between April 15 and September 15.

The temporary disturbance of local habitat is not expected to have population-level effects on wildlife because the amount of habitat crossed represents only a small portion of the habitat available to

wildlife throughout the Project area, much of which would return to preconstruction use. Construction at aboveground facilities would have limited impacts on wildlife because they would occur within previously disturbed areas. The widening of cleared areas within forested habitat could affect species that are intolerant of edge habitat, such as interior-dwelling bird species. However, long-term impacts from habitat alteration would be further minimized by the implementation of the mitigation measures contained in Transco's Plan, which would ensure revegetation of most areas disturbed by construction. After construction, wildlife would be expected to return and colonize post-construction habitats. To minimize traffic impacts on wildlife, contractors would be required to adhere to posted speed limits and speed limits and safe driving measures for the Project. Only vehicles necessary for construction would be allowed on the right-of-way. Contractors would transport crews to the right-of-way to minimize the number of vehicles on the right-of-way. Therefore, we conclude that the Project would not have a significant impact on wildlife or their habitat in the project area.

Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S. Code [USC] 703–711), and bald and golden eagles are additionally protected under the Bald and Golden Eagle Act (16 USC 668–668d). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Executive Order 13186 (66 Federal Register 3853) was enacted to, among other things, ensure that environmental analyses of federal actions evaluate the impacts of actions on migratory birds. Executive Order 13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations; avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the FWS; emphasize species of concern, priority habitats, and key risk factors; and give particular focus to population-level impacts.

On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding between FERC and the FWS Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds," which focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary Memorandum of Understanding does not waive legal requirements under the MBTA, Bald and Golden Eagle Protection Act, Endangered Species Act, Federal Power Act, NGA, or any other statutes, and does not authorize the take of migratory birds.

The vegetation communities associated with the Project provide potential habitat for migratory bird species including songbirds, waterbirds, and raptors. The Virginia Office of the FWS Information for Planning and Conservation report indicated there are 18 Birds of Conservation Concern in the Project area. Birds of Conservation Concern are a subset of birds protected under the MBTA that are more likely to become listed in the future.

Impacts on migratory birds and their habitat due to construction and operation of the Project would typically be similar to impacts on general wildlife (see section B.4.2). Potential impacts specific to migratory birds would include disorientation due to artificial illumination and potential strike of elevated Project components. Direct effects from construction include the displacement of birds and potential direct impacts. Most bird species would leave the area as construction activities approached. Many of these bird species would relocate into similar, nearby habitats. Depending on the season, construction could disrupt bird courting or nesting and breeding behaviors on and adjacent to the Project workspaces. If there were a lack of adequate habitat, some individuals could be forced into suboptimal habitats, which could increase inter- and intra-specific competition and lower reproductive success and survival. Loss of

habitat due to the pipeline facilities would result in temporary (during construction) and permanent (during operation) impacts on migratory birds. The magnitude of the impact would depend on the type of habitat and the rate at which vegetation regenerates after construction. The impact on forest-dwelling species would be greater because forest habitat would take a comparatively longer time to regenerate and would be prevented from re-establishing on the permanent right-of-way following construction. The influx and increased density of birds in some undisturbed areas caused by these movements could also reduce the reproductive success of bird species that are not displaced by construction. The impacts on open land and shrub-dwelling bird species would be less than that of forest-dwelling species as open land and scrub shrub areas would regenerate in less time than forested.

The primary concern for nesting birds is the cutting, clearing, and removal of existing vegetation during the primary nesting season. In Virginia, the primary nesting season occurs from March 15 through August 15. Transco has committed to not clear trees between April 15 and September 15 to avoid impacts on bats. This would protect nesting birds as well. Habitat loss would be minimized to the extent practicable by co-locating the Manassas Loop adjacent to the existing Transco right-of-way. Trees would be allowed to grow back on cleared workspaces beyond the permanent pipeline right-of-way.

Bald Eagle

The bald eagle is no longer a federally listed endangered or threatened species but is still protected under the Bald and Golden Eagle Protection Act and the MBTA. Transco has not performed a formal survey for bald eagles within the project area. However, Transco has routinely checked the Center for Conservation Biology Virginia Eagles Nest Locator (<https://ccbbirds.org/what-we-do/research/species-of-concern/virginia-eagles/nest-locator/>) to determine if the Project areas intersect with a bald eagle nest buffer. The viewer was last checked on August 13, 2018 and verified the Project does not intersect a bald eagle nest buffer. The nearest documented bald eagle nest to the Manassas Loop is greater than 3 miles away and greater than 5 miles away for Station 165. No nests were found within 660 feet during surveys. If eagle nests are located during construction, Transco would be required to comply with the Bald and Golden Eagle Protection Act, which requires notification to the FWS.

Given that Transco would not clear trees for construction during the nesting season, would not clear vegetation during the nesting season during operation per its Plan, would consult if eagle nests were identified during Project implementation, and has co-located the Manassas Loop adjacent to an existing line, we determine that the proposed Project would not significantly affect migratory bird species within or in close proximity to the Project area.

4.3 Fisheries

The Project would cross 20 waterbodies by dam and pump, 5 waterbodies would occur in the temporary workspace but not be crossed by the pipeline, 1 stream would be adjacent to an existing road, and one stream would be crossed via an existing culvert (see table 14 in section B.3.2, surface water resources). All waterbodies are freshwater and warmwater. No waterbodies would be affected by the proposed aboveground facilities, but two existing access roads occur near waterbodies; one would cross via an existing culvert and the other would parallel an existing access road. Typical freshwater species in Virginia are listed in table 18, and table 19 outlines fisheries of special concern.

Although the dam and pump method is proposed for all crossings where perceivable flow is present, upland construction techniques would be used to cross waterbodies when there is no perceivable flow at the time of crossing. Equipment to perform a dam and pump crossing would be onsite as a contingency should perceptible flow in waterbodies begin during construction. Waterbody crossings

Typical Freshwater Fish Species in Virginia			
Common Name	Scientific Name	Common Name	Scientific Name
Largemouth Bass	<i>Micropterus salmoides</i>	Yellow Perch	<i>Perca flavescens</i>
Smallmouth Bass	<i>Micropterus dolomieu</i>	Chain Pickerel	<i>Esox niger</i>
Spotted Bass	<i>Micropterus punctulatus</i>	Muskellunge	<i>Esox masquinongy</i>
Black Crappie	<i>Pomoxis nigromaculatus</i>	Northern Pike	<i>Esox lucius</i>
White Crappie	<i>Pomoxis annularis</i>	Brook Trout	<i>Salvelinus fontinalis</i>
Bluegill	<i>Lepomis macrochirus</i>	Brown Trout	<i>Salmo trutta</i>
Flier	<i>Centrarchus macropterus</i>	Rainbow Trout	<i>Oncorhynchus mykiss</i>
Green Sunfish	<i>Lepomis cyanellus</i>	Blue Catfish	<i>Ictalurus furcatus</i>
Pumpkinseed	<i>Lepomis gibbosus</i>	Channel Catfish	<i>Ictalurus punctatus</i>
Redbreast Sunfish	<i>Leopomis auritus</i>	Flathead Catfish	<i>Pylodictis olivaris</i>
Redear Sunfish	<i>Lepomis microlophus</i>	White Catfish	<i>Ameiurus catus</i>
Roanoke Bass	<i>Ambloplites cavifrons</i>	Alewife	<i>Alosa pseudoharengus</i>
Rock Bass	<i>Ambloplites rupestris</i>	American Shad	<i>Alosa sapidissima</i>
Warmouth	<i>Lepomis gulosus</i>	Blueback Herring	<i>Alosa aestivalis</i>
Hybrid Striped Bass	<i>Morone hybrid</i>	Hickory Shad	<i>Alosa mediocris</i>
Striped Bass	<i>Morone saxatilis</i>	Bowfin	<i>Amia calva</i>
White Bass	<i>Morone chrysops</i>	Carp	<i>Cyprinus carpio</i>
White Perch	<i>Morone americana</i>	Longnose Gar	<i>Lepisosteus osseus</i>
Sauger	<i>Sander canadensis</i>	Freshwater Drum	<i>Aplodinotus grunniens</i>
Walleye	<i>Sander vitreus</i>		
Source: VDGIF 2018e			

Fisheries of Special Concern Crossed by the Southeastern Trail Project				
Waterbody ID	Waterbody Name	MP	County	Fishery Concern
SPW06	South Run	1574.0	Prince William	Kettle Run Stream Conservation Unit (Aquatic Species)
SPW06	South Run	1575.5 ^a	Prince William	Kettle Run Stream Conservation Unit (Aquatic Species)
a - Not crossed by pipeline centerline				
Source: VDCR-DNH 2018				

would be perpendicular to the flow where practicable. Grading at approaches to waterbodies may be required to create a safe work surface and to allow the necessary area for pipe bending. If grading would be required, it would be directed away from the waterbody to reduce the possibility of disturbed soils being transported into the waterbody by wind or water erosion.

Construction impacts on fishery resources may include direct contact by construction equipment with food resources in the form of relatively immobile prey, increased sedimentation and water turbidity immediately downstream of the construction work area, alteration or removal of aquatic habitat cover, introduction of pollutants, impingement or entrainment of fish and other biota associated with the use of water pumps at dam and pump crossings, and downstream scour associated with use of those same

pumps. Fish passage would only be temporarily interrupted during the dam and pump process and would be restored immediately after the restoration of the stream bed and banks. The short term and localized interruption of fish passage is not anticipated to dramatically affect the migration of fish within the stream systems. Reductions in light penetration and photosynthetic oxygen production could also occur as a result of increased suspended sediment in the water, which, combined with increased biological oxygen demand caused by re-suspension of organic materials, can result in reduced oxygen availability in the water column. These conditions could cause fish to temporarily avoid an area.

To reduce turbidity and sedimentation potentially caused by vehicles that cross waterbodies during construction, Transco would install temporary equipment bridges where practicable. Per Transco's Procedures, only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation, and crossings of each waterbody would be limited to one pass for given clearing equipment. Equipment bridges would be designed to allow unrestricted flow and to prevent soil from entering the waterbody and would remain in place through restoration. Per Transco's Plan and Procedures, turbidity would be minimized by storing trench spoil excavated from within the waterbody a minimum of 10 feet from the waterbody edge or placed in an ATWS. Erosion control devices would be placed around the spoil piles to prevent spoil flow back into the waterbody. Once the pipe is placed in the trench, the excavated material would be replaced and the waterbody banks would be restored to preconstruction contours in accordance with Transco's Procedures.

Accidental releases of gasoline, hydraulic fluid, and other potential contaminants used and stored on the construction right-of-way have potential to directly impact water quality and directly or indirectly impact fisheries resources. Transco would implement its Procedures and E&SC Plan, which restrict the storage of toxic materials to further than 100 feet from the edge of the waterbody and provide cleanup and notification procedures should a spill occur.

In-water blasting could occur at some waterbody crossings. Transco would implement its Blasting Plan and coordinate with appropriate agencies to determine if monitoring or mitigation efforts would be necessary. Transco's Blasting Plan also outlines proper precautions to minimize potential impacts.

Transco would utilize municipal sources for water to be used during hydrostatic testing. Discharge of test water would occur in accordance with applicable state water regulations and federal and state discharge requirements. After hydrostatic testing is complete, the test water would be dechlorinated for municipal water (if required) and discharged into well-vegetated upland areas utilizing energy dissipation devices such as hay bales to minimize erosion and sedimentation. Some chemicals may be used for dechlorination. No other chemicals are planned to be added to the hydrostatic test water and no chemicals would be used to dry the pipeline after testing. Final discharge locations would depend on the length of the test section and applicable permit requirements. Based on the above mitigation measures, no significant impacts on fisheries would occur as a result of hydrostatic testing of the pipeline facilities.

Additionally, where practicable for waterbody crossings that do not require a dry crossing, Transco would complete in-waterbody activities associated with minor waterbodies within 24 hours and in-waterbody activities associated with intermediate waterbodies within 48 hours. Once in-waterbody work is started, Transco would work continuously until the pipe is installed and the trench within the waterbody is backfilled.

Several species of mussels and fish are known to occur in the vicinity of the Manassas Loop, including the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) and the state endangered blackbanded sunfish (*Enneacanthus chaetodon*). However, neither of these species were observed during surveys performed in streams that would be crossed by the Manassas Loop during May, June, and August

2018 (see section B.4.2 for details). Transco received an email from VDGIF on September 6, 2018 acknowledging the results of the aquatic survey and minimization measures included and stating that no additional consultation is required.

Given all waterbodies in the Project area are warmwater, Transco's Procedures require construction from June 1 through November 30. The VDGIF also imposes a timing restriction for warmwater fisheries between April 15 and July 15. Therefore, in compliance with both, Transco would construct in waterbodies between July 15 and November 30. Transco has stated that neither FWS nor VDGIF has imposed additional timing restrictions, but it would comply with any additional restrictions required by these agencies.

Waterbody banks would be restored to pre-construction conditions to the extent possible following construction, thereby minimizing long-term impacts on fisheries. Riparian and aquatic vegetation would recover over time, which FERC would confirm via site visits until restoration is complete. Based on the implementation of timing restrictions for in-water work as stated above, its E&SC Plan, and its Blasting Plan, we conclude that impacts on fisheries would be sufficiently minimized.

4.4 Special Status Species

Special status species are those species for which state or federal agencies provide an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the Endangered Species Act or are considered candidates for such listing by the FWS, those species that are state-listed as threatened or endangered, and state species of special concern. No special status species were noted in Project areas during surveys.

As outlined in sections below, special status species may be present in the Manassas Loop and Station 165 Project areas. However, through the completion of field surveys, correspondence with agencies, implementation of BMPs, and incorporation of regulatory guidelines in Project activities and our consultation, the Project is not likely to adversely affect special status species.

Table 20 indicates the federal and state sensitive, rare, and listed species and species of concern that could occur in these portions of the Project area based on surveys, agency correspondence, and our analysis.

Federally and State-Listed Species

Transco, acting as the Project's non-federal representative to FERC, initiated informal consultation with the FWS, VDGIF, VDCR, and the Virginia Department of Agriculture and Consumer Services (VDACS) in December 2017. Review of the correspondence with the FWS Virginia Ecological Services Field Office indicated that the northern long-eared bat (federally threatened), dwarf wedgemussel (federally endangered), and harperella (federally endangered) could occur in the Manassas Loop and/or Station 165 Project areas. The federally proposed yellow lance could also occur in these portions of the Project area. No other federally listed or proposed species would occur in these portions of the Project area. No critical habitat occurs in any of the Project areas.

The brook floater, dwarf wedgemussel, spirit supercoil, Roanoke logperch, little brown bat, tri-colored bat, harperella (all state endangered), green floater, orangefin madtom, Carolina darter, timber rattlesnake, loggerhead shrike, peregrine falcon, Henslow's sparrow, and Northern long-eared bat (all state threatened) could occur in the Manassas Loop or Station 165 Project areas. The spotted turtle, a species of concern as a result of collection, could also occur.

Construction and operation of the Mainline Facility Station Reversals and Deodorization Modifications and Mainline Valve Deodorization Modifications would have *no effect* on threatened or endangered species, as construction activity would occur in previously disturbed, maintained areas where no tree clearing is proposed, no sensitive habitats occur, and no wetlands or waterbodies occur. Construction at Station 185 would occur within the existing building so would also have *no effect* on threatened or endangered species. Ground-disturbing activities at Station 175 would be limited to previously disturbed areas at the existing facility, and no vegetation is present. Therefore, Station 175 activities would have *no effect* on threatened or endangered species. Construction and operation of these portions of the Project would also not impact state-listed or state-sensitive species for the same reasons.

Mussels

Dwarf wedgemussel (**state and federally endangered**), brook floater (**state endangered**), green floater (**state threatened**), and yellow lance (**federally proposed**) are mussel species found in perennial waterbodies, including Cedar Run, which the Project would cross tributaries of in six locations.

Freshwater mussels could also be affected by elevated turbidity and suspended sediments. Although freshwater mussels in the construction work area would be relocated by qualified biologists and in accordance with Virginia mussel protocols, downstream sessile species could be affected. Aquatic invertebrates, including insect larvae, would generally be unable to avoid work areas. However, these areas would rapidly recolonize as a result of upstream drift and new egg deposition from adults within days to months (Brooks and Boulton, 1991; Matthaei and Townsend, 2000).

Abbreviated surveys, as recommended by VDGIF, for these species were performed in May, June, and August 2018 within Cedar Run, Owl Run, Kettle Run, and South Run (all waterbodies containing potentially suitable habitat that would be impacted by the Project). These waterbodies were surveyed for mussel species 328.1 feet (100 meters) upstream and 1,312.3 feet (400 meters) downstream of the proposed pipeline crossings as recommended by VDGIF. A habitat assessment was also performed in Walnut Branch and South Run for 65.6 feet (20 meters) upstream and 262.5 feet (80 meters) downstream to determine if suitable habitat or individuals occupied streams that would be impacted by the Project.

The identity of one specimen found during surveys was unknown until September 20, 2018 when it was determined to be *Strophitus undulates* (a common bivalve species). No federally listed mussel species were observed during surveys. However, two species of Greatest Conservation Need, creepers and yellow lance, were found in large numbers. The VDGIF recommended in an email dated August 28, 2018 that Transco perform one-time relocations, from 10 meters upstream of impacts through the impact site and downstream to 20 meters below the impact site, for common mussels and those Species of Greatest Conservation Need at Project sites at Kettle Run and Cedar Run. However, Kettle Run would not be impacted by project activities. Transco agreed to perform the one-time relocation in Cedar Run at least 30 days prior to construction in that area. VDGIF stated in an email on August 28, 2018 that time of year restrictions would not be necessary given the identification of the unknown bivalve, and assuming all work is performed using dry crossing methods while implementing strict erosion and sediment controls. Transco would implement the measures contained in its Procedures and E&SC Plan to minimize impacts on aquatic species.

All suitable waterbodies containing suitable habitat for state and federally listed mussel waterbodies would be crossed using a dry crossing technique, which, if properly installed and maintained during construction and restoration, generally produce minor levels of sediment and turbidity (Reid and Anderson, 1999). With the implementation of the above minimization measures, including one-time relocations of target mussels performed 30 days or less prior to construction, impacts on sensitive and

Table 20

Federally- and State-listed Species Potentially Occurring within the Southeastern Trail Project Area

Common Name	Scientific Name	Federal Status ^a	State Status ^a	Suitable Habitat	Project Facility	Potential Suitable Habitat Present
Clams						
Dwarf Wedgemussel	<i>Alasmidonta heterodon</i>	E	E	Generalist, it inhabits small waterbodies less than five meters wide to large rivers more than 100 meters wide. Found in a variety of substrates including clay, sand, gravel, pebble, and silt depositional areas. Usually found in hydrologically stable areas from very shallow waters to depths of 25 feet.	Manassas Loop	Perennial waterbodies around five meters or greater wide (>15 feet).
Brook Floater	<i>Alasmidonta varicosa</i>	NL	E	Found only in habitats with consistently flowing water – from small waterbodies to large rivers. Favors clean water in gravel or sand and gravel substrates.	Manassas Loop	Perennial waterbodies
Green Floater	<i>Lasmigona subviridis</i>	NL	T	Found in small creeks, large rivers, and sometimes canals. Intolerant of strong currents and occurs in pools and other calm water areas. Preferred substrate is gravel and sand in water depths of one to four feet. Found in hydrologically stable waterbodies, not prone to flooding and drying.	Manassas Loop	Perennial waterbodies with water depths at least one foot deep.
Yellow Lance	<i>Elliptio lanceolata</i>	FP	NL	Found in smaller waterbodies to medium size rivers to smaller waterbodies. Sand-loving species often found buried deep in clean coarse to medium sand, but can sometimes be found in gravel. Often found at the downstream end of stable sand and gravel bars.	Manassas Loop	Perennial waterbodies
Gastropods						
Spirit Supercoil	<i>Paravitrea hera</i>	NL	E	Leaf litter on waterbody banks. Endemic to Virginia and has been reported from only one location in Pittsylvania County.	Station 165	Waterbody banks with leaf litter at time of construction
Fish						
Roanoke Logperch	<i>Percina rex</i>	E	E	Occupies medium to large warm-water waterbodies and rivers of moderate gradient and relatively unsilted substrates.	Manassas Loop, Station 165	Intermediate perennial waterbodies
Orangefin Madtom	<i>Noturus gilberti</i>	NL	T	Swift riffles with small cobble substratum; occupies interstitial spaces among cobbles; generally not in areas with large amounts of sand and silt. Found in riffles and runs of medium to large, clear waterbodies where it lives under gravel, rubble and other cover.	Manassas Loop, Station 165	Perennial waterbodies
Carolina Darter	<i>Etheostoma collis</i>	NL	T	Inhabits small to moderate sized waterbodies in areas of low current velocity. Preferred substrates are characterized by mud, sand, and sometimes bedrock. Somewhat tolerate of fine sediments covering substrates.	Manassas Loop, Station 165	Perennial waterbodies

Table 20

Federally- and State-listed Species Potentially Occurring within the Southeastern Trail Project Area

Common Name	Scientific Name	Federal Status ^a	State Status ^a	Suitable Habitat	Project Facility	Potential Suitable Habitat Present
Reptiles						
Timber Rattlesnake	<i>Crotalus horridus</i>	NL	T	In western Virginia, upland hardwood and mixed oak-pine forests in areas with ledges or talus slopes. Found in open woods, grass fields, and secondary growth during summer. In southeastern Virginia, occupies hardwood and mixed hardwood-pine forests, cane fields, and ridges and glades adjacent to swampy areas.	Manassas Loop, Station 165	Potential
Spotted Turtle	<i>Clemmys guttata</i>	NL	CC	Ponds, ditches, flooded fields, creeks, the floodplain of meandering creeks, bogs, marshy pastures, and forested wetlands. Woods are often near or overhead. Summer habitat includes areas of abundant aquatic macrophytes or grasses, but it is not found in deep water.	Manassas Loop	Potential
Birds						
Loggerhead Shrike	<i>Lanius ludovicianus</i>	NL	T	Semi-open country with lookout posts; wires, trees, scrub. Breeds in any kind of semi-open terrain, from large clearings in wooded regions to open grassland or desert with a few scattered trees or large shrubs. In winter, may be in totally treeless country if fences or wires provide hunting perches.	Manassas Loop, Station 165	Potential
Peregrine Falcon	<i>Falco peregrinus</i>	NL	T	Open country, cliffs (mountains to coast); sometimes cities. Over its wide range, found in wide variety of open habitats, from tundra to desert mountains. Often near water, especially along coast, and migrants may fly far out to sea. Limited by availability of nest sites and prey; thus, it often moves into cities, nesting on building ledges and feeding on pigeons. In Virginia, reintroduced peregrines nest on bridges, buildings and other artificial structures in the Coastal Plain. As of 2000, only one pair was known to be nesting on a natural cliff — this site was found within Shenandoah National Park.	Manassas Loop	Potential
Henslow's Sparrow	<i>Ammodramus henslowii</i>	NL	T	Weedy fields. Requirements not well understood; often absent from seemingly suitable habitat. Breeds in fields and meadows, often in low-lying or damp areas, with tall grass, standing dead weeds, and scattered shrubs. Sometimes in old pastures, occasionally in hayfields. Winters in various kinds of rank weedy fields.	Manassas Loop	Potential
Mammals						

Table 20

Federally- and State-listed Species Potentially Occurring within the Southeastern Trail Project Area

Common Name	Scientific Name	Federal Status ^a	State Status ^a	Suitable Habitat	Project Facility	Potential Suitable Habitat Present
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	T	T	Winter hibernacula includes caves and/or abandoned mines; Summer roosting habitat: <ul style="list-style-type: none"> > 3 inches diameter at breast height trees; Roosting structures (exfoliating bark, cracks, crevices, or cavities) that provide protection from the elements; and Free from vines, or other obstructing vegetation, that would preclude use by roosting bats. 	Manassas Loop, Station 165	No-Winter Potential -Summer
Little Brown Bat	<i>Myotis lucifugus</i>	NL	E	Winter hibernacula includes caves and/or abandoned mines. Summer roost in human-made structures, under tree bark, in rock crevices, and in tree hollows. Prefer old growth and mature trees. Maternal colonies located near water in buildings, bat houses, and tree hollows.	Manassas Loop, Station 165	No-Winter Potential -Summer
Tri-colored Bat	<i>Perimyotis subflavus</i>	NL	E	Winter hibernacula includes caves and/or abandoned mines; open woods near water, rock cliffs, buildings and caves in the summer.	Manassas Loop, Station 165	No-Winter Potential -Summer
Plants						
Harperella	<i>Ptilimnium nodosum</i>	E	E	Seasonally flooded rocky waterbodies and coastal plain ponds.	Manassas Loop	Potential
<p>a - E = Endangered; T= Threatened; C = Candidate; R = Rare; BGEPA = Bald and Golden Eagle Protection Act; CC=Collection Concern, FP=Federal Proposed; NL = Not Listed</p> <p>Source: FWS IPaC System, NatureServe Explorer 2018, VDGIF, VAFWIS, VDCR-NHD 2018</p>						

listed mussels would be sufficiently minimized. VDGIF stated on September 6, 2018 that no additional coordination would be required.

The Project *may affect but is not likely to adversely affect* the dwarf wedgemussel and yellow lance. The FWS provided a self-certification letter on August 13, 2018 that stated that consultation was complete for federally listed and proposed species, which includes the dwarf wedgemussel and yellow lance.

Gastropods

The **spirit supercoil**, a terrestrial snail, occurred in a list of species of concern in Virginia using VDGIF's Virginia Fish and Wildlife Information Service (VAFWIS) program on January 29, 2018. This species, however, was not identified by VDGIF staff as a potential species with known records within or near the study area during the VDCR project review process. The species is only documented in one location in Pittsylvania County, where the only project element includes the facility upgrades to Station 165, where wetlands and waterbodies, while occurring onsite, would not be impacted. Given Transco would implement measures contained in its Plan and Procedures, the VDCR did not identify the need for protective measures or additional surveys, we find that impacts on the spirit supercoil would be sufficiently minimized.

Fish

Roanoke logperch (state and federally endangered), **orangefin madtom**, and **Carolina darter** (both state threatened) could occupy perennial waterbodies in the Project area. As discussed earlier in section B.4.3, impacts on these species include but are not limited to direct contact by construction equipment, alteration or removal of aquatic habitat cover, introduction of pollutants, impingement or entrainment associated with the use of water pumps at dam and pump crossings, and downstream scour associated with use of those same pumps. The Roanoke logperch was not identified in the FWS Information for Planning and Consultation (IPaC) system as potentially occurring in the area, but was identified in VDGIF's VAFWIS system. Aquatic (fish and mussel) surveys were performed in affected waterbodies within the Project area (as stated above), however, and these species were not observed. VDGIF stated in an email on August 28, 2018 that time of year restrictions would not be necessary, and assuming all work is performed using dry crossing methods while implementing strict erosion and sediment controls, no additional minimization would be required. VDGIF acknowledged Transco's construction and mitigation plans in an email on September 6, 2018, stating that no further input would be provided by VDGIF. With the implementation of Transco's Procedures and E&SC Plan, we find that the impacts on fish species would be sufficiently minimized.

The Project *may affect but is not likely to adversely affect* the Roanoke logperch. The FWS provided a self-certification letter on August 13, 2018 that stated that consultation was complete for federally listed and proposed species with the potential to occur in the Project area.

Reptiles

The **timber rattlesnake** (state threatened) and **spotted turtle** (collection concern in Virginia) could occur in suitable habitat in the Manassas Loop, and the timber rattlesnake could also occur at Station 165. Their habitats are common in the region and within the Project study area. Potential impacts include those noted above in section B.4.2 such as direct impacts on habitat and individuals and

conversion or modification of habitat. VDGIF has not provided minimization measures, including time of year restrictions, for either species.

Given that Transco would implement its Plan, Procedures, SPCC Plan, and E&SC Plan, impacts on these species would be sufficiently minimized.

Birds

Loggerhead shrike, peregrine falcon, and Henslow's sparrow are Virginia threatened species that could occur in the Manassas Loop Project area, and the Loggerhead shrike could also occur near Station 165. No individuals of these species were observed during field surveys for the Project. No peregrine falcon nests or boxes were observed within or adjacent to the survey corridor. Impacts on these species would be similar to other migratory birds as discussed earlier in section B.4.2. The biggest impacts would occur if trees were cleared during the nesting season as eggs or nestlings could be impacted. Otherwise, avian wildlife would be able to avoid the project area. VDGIF states that nesting timeframes are the following:

Loggerhead shrike – April 1 – July 31;
Peregrine falcon – February 15 – July 15 for activities within 600 feet of nest or box; and
Henslow's sparrow – April 1 – August 31.

Transco would not clear trees between April 15 and September 15, thereby avoiding most of the nesting seasons for these species. Transco would also not perform maintenance clearing between April 15 and August 1 during operation per its Plan. No additional minimization measures were recommended by regulatory agencies. Given that clearing would avoid the majority of the avian nesting season for these three state threatened species, and these species were not observed during surveys of the Project area, we find that impacts on the loggerhead shrike, peregrine falcon, and Henslow's sparrow would be sufficiently minimized.

Bats

The Northern long-eared bat (federally and state threatened), little brown bat (state endangered), and tricolored bat (state endangered) occur in forested areas in Virginia. A total of 22.1 acres of forested area would be cleared during construction along the Manassas Loop with 5.4 acres permanently maintained following construction in a non-forested state. The remaining 16.7 acres of forested area would be restored in accordance with Transco's Plan and Procedures. A total of 26.3 acres of forest would be cleared during construction at Station 165 with 7.1 acres permanently maintained following construction in a non-forested state. The remaining 19.2 acres would be restored in accordance with Transco's Plan and Procedures.

The **northern long-eared bat** (NLEB) was formally listed as a federally threatened species in April 2015. Northern long-eared bats occur in widespread, but uncommon, patterns in forest habitats. During the winter, the bat hibernates in caves and underground mines. Individuals may travel up to 35 miles from their summer habitat to their winter hibernacula. Summer roosting habitat, including maternity roosts, includes tree cavities, exfoliating bark, snags of dead or dying trees, and man-made structures (e.g., barns).

Transco has routinely checked the NLEB Winter Habitat & Roost Tree Application (<http://dgifvirginia.maps.arcgis.com/apps/webappviewer/index.html?id=32ea4ee4935942c092e41ddcd19e5ec5>) to determine if the Project areas are near known NLEB winter hibernacula or a known maternity

roost tree. This Application was last checked on August 13, 2018. The Project areas are not near any known NLEB winter hibernacula or known maternity roost trees. According to the Application, the nearest known hibernacula to the Manassas Loop is 65 Miles to the west of the southern end of the pipeline. The nearest known NLEB hibernacula to Station 165 is 57 miles to the northwest. The nearest known occupied maternity roost tree for the Northern Long-eared Bat is 123.5 miles to the southwest of the Manassas Loop and 64 miles northwest of Station 165.

The **little brown bat** is one of the most abundant bats in North American, and generally utilizes human structures for roosting but also can be found in the summer under tree bark, rock crevices, and tree hollows (WDNR 2017). The VDGIF Habitat Viewer (VDGIF 2018b) indicates that the nearest known tri-colored bat and/or little brown bat to the Manassas Loop is located 76.5 miles to the southwest of the southern end of the pipeline. The nearest known tri-colored bat and/or little brown bat hibernacula to Station 165 is located 58 miles to the northwest.

According to the Project biological survey report (Cardno 2018), habitat does exist within the study area that could provide potential roost trees during summer for the three bat species. The VDGIF has issued a Guidance Document on Best Management Practices for Conservation of Little Brown Bats and Tri-Colored Bats (VDGIF 2016). The document states “the VDGIF has not tracked and is not aware of any little brown bat or tri-colored bat roost trees.” Transco has committed to following this guidance. Bat mist net surveys are not recommended in the survey report, unless required by the agencies as a project-specific request.

The **tri-colored bat** (state endangered) was noted in correspondence dated January 18, 2018 and June 26, 2018 from VDCR as being in population decline by greater than 90 percent. Of particular concern is the Transco Road Net Conservation Site, which occurs within the Station 165 project site. The Transco Road Net Conservation site has been given a biodiversity significance ranking of B3, which represents a site of high significance. The natural heritage resource of concern at the site is the tri-colored bat. Approximately 15.8 acres of planted pine would be cleared at this site, including 7.1 acres of permanent removal. Based on communications with VDGIF via an email on August 28, 2018, this species typically hibernates in caves in the western part of the state, but may commune in roosting habitats during summer, particularly pup rearing. No roosting sites have been identified near the site, nor any hibernacula. As such, VDGIF does not recommend the Project would have any significant impact upon the species.

Transco intends to comply with the VDGIF Guidance Document on Best Management Practices for Conservation of Little Brown Bats and Tri-Color Bats. Time of year restrictions are based on known hibernacula or known roost trees. The VDGIF brown bat and tri-colored bat Habitat Application online viewer tracks known hibernacula and known roost trees for these species. As of July 16, 2018, there are no known hibernacula or known roost trees near Station 165.

Transco would not clear suitable bat habitat between April 15 and September 15, including the forested area within the Transco Road Net Conservation Site, which would be protective of all bat species. The FWS and applicable state agencies in Virginia did not identify any known hibernacula, maternity roost trees, or swarming areas near the project areas. No potential winter hibernacula for bats was observed at the site during surveys. Therefore, per the Final 4(d) Rule (FWS 2016d), the Project would not result in prohibited incidental take, because of the following:

- Transco would not be clearing known maternity roost trees or trees within 150 feet of known maternity roost trees between June 1 and July 31;

- Transco would not remove trees within 0.25 mile of a known hibernacula at any time of the year; and
- Project activities would not occur within known hibernacula.

The Project *may affect, likely to adversely affect* the NLEB based on the implementation of the 4(d) rule. The FWS provided a self-certification letter on August 13, 2018 that stated that consultation was complete for this species with this determination and with application of the 4(d) rule, for which the streamlined consultation form is attached as appendix E.

Plants

Harperella (state and federally endangered) is a perennial herb in the carrot family that is believed to occur in Prince William, Frederick, and Mecklenburg Counties (Giese 2018, FWS 2018) in Virginia. According to Giese (2018), hydrology is the most essential factor in harperella habitat, so the substrate is expected to be stable and seasonally flooded. Areas along creeks that are too wet or dry would not support harperella. Harperella is found in sheltered areas away from the erosive effects of rapidly moving water. It is also usually found on the downstream side of large rocks or amidst thick clones of water willow (*Justicia americana*). If found in the Project area, ground disturbing activities could cause mortality or injury to individual specimens within the workspace or access roads. Transco could also potentially injure the plants during construction activities if dust, dirt, or construction debris settled on harperella that were adjacent or in the vicinity of the construction workspace or access roads. Transco's maintenance of the permanent right-of way could also potentially affect the microclimate and habitat of harperella after construction is complete.

This species was identified in the FWS "*list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project*" letter dated August 13, 2018 as potentially occurring the Project area. A habitat evaluation and survey of the 14 streams and 4 ponds with suitable habitat within the Project area was performed in July 2018 during the optimal timeframe (blooming period and aquatic factors were met). Although suitable habitat was found along several streams, no harperella were observed during surveys. Most of the streams had low- to medium-quality habitat and minimal potential to support harperella. All four ponds were low-quality habitat.

Given no specimens were located during surveys of the Project areas and habitat quality was low to medium, the Project *may affect but is not likely to adversely affect* harperella. The FWS provided a self-certification letter on August 13, 2018 that stated that consultation was complete for federally listed and proposed species with the potential to occur in the Project area.

5.0 LAND USE, RECREATION, AND VISUAL RESOURCES

5.1 Land Use

The following section discusses land use impacts associated with the construction and operation of the Project. Land uses that would be affected by Project construction and operation are quantified in table 21 and defined in the following sections.

Agricultural Lands

Agricultural lands in the Project area consist of cultivated crops and hay/pasture. Cultivated crops include areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco,

Table 21

Land Uses Affected by Construction and Operation of the Project (acres)

Facility	Agricultural		Forest		Pine Plantation		Developed Land		Wetland		Open Water		Open Land		Total	
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.
Pipeline																
Manassas Loop	65.9	15.7	17.6	5.4	0.0	0.0	2.7	0.6	2.0	0.7	0.6	0.2	11.9	2.7	100.7	25.2
Additional Temporary Workspace	32.1	0.0	4.6	0.0	0.1	0.0	0.7	0.0	0.0	0.0	0.0	0.0	4.6	0.0	42.1	0.0
Access Roads	1.0	0.1	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.1	0.1	1.9	0.2
Contractor Yard	51.6	0.0	0.0	0.0	0.0	0.0	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	54.9	0.0
Pipeline Subtotal	150.6	15.8	22.2	5.4	0.1	0.0	7.5	0.6	2.0	0.6	0.6	0.2	16.6	2.8	199.6	25.4
Compressor Stations																
Station 185	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Station 175	0.0	0.0	0.0	0.0	2.7 ^a	0.0	32.2	7.0	0.0	0.0	0.4	0.2	0.0	0.0	35.8	7.2
Station 165	0.0	0.0	10.5	0.0	15.8	7.1	45.8	2.9	0.0	0.0	0.0	0.0	10.0	0.0	82.1	10.0
Compressor Stations Subtotal	0.0	0.0	10.5	0.0	18.5	7.1	78.0	9.9	0.0	0.0	0.4	0.2	10.0	0.0	117.9	17.2
Mainline Facility Station Reversals and Deodorization Modifications																
Station 65	0.0	0.0	0.5 ^a	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	27.5	0.0
Station 140	0.0	0.0	0.3 ^a	0.0	0.0	0.0	28.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.6	0.0
Station 130	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.8	0.0
Station 115	0.0	0.0	9.5 ^a	0.0	0.0	0.0	32.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	42.3	0.0
Station 116	0.0	0.0	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.7	0.0
Station 120	0.0	0.0	4.3 ^a	0.0	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	24.5	0.0
Station 125	0.0	0.0	0.7 ^a	0.0	0.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.7	0.0
Station 135	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0

Table 21

Land Uses Affected by Construction and Operation of the Project (acres)

Facility	Agricultural		Forest		Pine Plantation		Developed Land		Wetland		Open Water		Open Land		Total		
	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	Const.	Oper.	
Mainline Facility Station Reversals and Deodorization Modifications Subtotals	0.0	0.0	15.3	0.0	0.0	0.0	161.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	176.4	0.0	
Mainline Valve Deodorization Modifications																	
MLV 115-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0
MLF 115-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.4	0.0
MLV 120-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	0.0
MLV 120-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.6	0.0
MLV 125-10	0.0	0.0	0.2 ^a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.8	0.0
MLV 125-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0
MLV 130-10	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
North Georgia Lateral Interconnect ^b	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Savannah River Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
MLV 130-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7	0.0
MLV 135-10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0
MLV 135-20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	1.3	0.0
Elba Express Interconnect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5	0.0	2.5	0.0
Mainline Valve Deodorization Modifications Subtotal	0.0	0.0	0.2	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	9.9	0.0	14.7	0.0
Total Impacts	150.6	15.8	48.2	5.4	18.6	7.1	251.2	10.5	2.0	0.6	1.0	0.4	36.5	2.8	508.6	42.6	

a – Although trees occur within the workspace, Transco would not remove these trees during the course of the Project.

b - See Station 125.

and cotton, and also perennial woody crops, such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes land being actively tilled.

Hay/Pasture area include grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

Open Lands

Open lands include open spaces, scrub-shrub, and rights-of-way. Open spaces consist of open land communities and scrub-shrub areas such as heavily-maintained roadway and transmission line corridors, as well as fallow fields and active agricultural pasture land. The level of maintenance varies and actively determines the species composition in these communities. Scrub-shrub areas are dominated by shrubs less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, and trees stunted due to environmental conditions. Rights-of-way include existing linear rights-of-way, including roadways, overhead power transmission lines, and major and minor linear utilities.

Upland Forest

Upland forest consists of mixed forest, pine forest, and planted pine. Mixed forest includes areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.

Pine forest includes areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year and consist of pine. The canopy is never without green foliage. Planted pine plantations in Virginia typically consist of “tree farms” or areas of active silviculture. Common planted pine species include southern yellow pine species, which include: shortleaf pine; loblolly pine; and, slash pine.

Developed Land

Developed land includes areas with a mixture of constructed materials and vegetation and impervious surfaces. Approximately 50 to 79 percent of the total project land cover is considered to be medium-intensity developed areas. These areas most commonly include single-family housing units and pipeline facilities. Low-intensity developed areas include areas with a mixture of constructed materials and vegetation, where impervious surfaces account for 20 to 49 percent of total cover. These areas also commonly include single-family housing units or farm areas. In these areas, vegetation may account for 20 to 70 percent of land cover. Vegetation typically consists of a mixture of deciduous, coniferous, and evergreen trees; ornamental trees and shrubs; planted grasses; and other groundcover.

Wetland

Wetlands in the Project area include emergent wetlands and forested wetlands. Emergent wetlands are areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Forested wetlands are areas where trees account for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Open Water

Open Water consists of ephemeral, intermittent, and perennial waterbodies and ponds and accounts for less than 0.2 percent of the total Project land cover.

Pipeline Facilities

Transco proposes to use a 110-foot-wide temporary construction right-of-way for the Manassas Loop. The Manassas Loop would be located at a 25-foot offset from the existing Transco Mainline C pipeline for the majority of the route. The temporary construction right-of-way for the Manassas Loop would overlap with the Transco Mainline right-of-way (typically by 40 feet) during construction. The permanent right-of-way for the Manassas Loop would include 25 feet of the existing Transco Mainline right-of-way and 25 feet of new permanent right-of-way over the length of the pipeline to facilitate operation and maintenance.

ATWS areas include additional work space beyond the permanent right-of-way and temporary construction right-of-way that are typically related to special construction techniques, such as road bores and wetland and waterbody crossings, equipment staging along the right-of-way, construction consumables storage (such as matting), pipeline points of intersection, fence line crossings, and at locations where additional volumes of spoil would be generated.

Transco would use existing public and private roads to access the construction work area. One new permanent access road (AR-FQ-010) would be constructed to provide access to MLV No. 180-22. One new access road (AR-FQ-003) would also be constructed to provide access to the Manassas Loop during construction and would be restored to pre-construction condition following construction, as requested by the landowner. Existing access roads may require modifications or improvements to safely support the anticipated loads and size of equipment and material movement. No road widening is planned as a part of the Project. See section A.6 for more information on access roads.

Contractor yards and staging areas would be needed for construction and contractor management offices, equipment and vehicle staging, and storage of pipe and other materials.

A listing of road and railroad crossings and proposed crossing methods are identified by MP in table 10. The Manassas Loop pipeline would be installed at a minimum depth of 5 feet below the center of the road and a minimum of 10 feet below the railroad or as required by applicable crossing permits and approvals, and would be designed to withstand anticipated external loadings. ATWS areas would be required at road and railroad crossings to accommodate the additional spoil generated from the entrance and exit pits at bored crossings or from the increased excavation depths at open-cut road crossings, as well as for staging of pipe and vehicle parking. Where the temporary construction right-of-way is accessible from a paved roadway, construction entrances may be installed to minimize tracking of dirt and mud onto the roadway.

In general, construction and operation of the Project would result in temporary impacts on the majority of land uses traversed by the Manassas Loop, and permanent impacts on those lands within the permanent right-of-way. Most Project impacts are minor and with few exceptions (discussed in the following sections), short-term, because impacted areas would be restored as soon as practicable after construction.

Impacts have been minimized by co-locating with the existing Transco Mainline C pipeline for the majority of the route and limiting the temporary construction right-of-way to the extent practicable to

safely construct and maintain the Project. Impacts would be mitigated by the methodologies and applicable BMPs in the Transco Plan and the Transco Procedures. Restoration of impacted lands would be completed in accordance with the Transco Plan and Transco Procedures, USACE permit conditions, and other relevant permit conditions and requirements.

Aboveground Facilities

Temporary impacts associated with equipment staging and vehicle parking and ground-disturbing activities would be limited to the previously disturbed areas within the existing Station 175 and 185 facilities. No land use impacts would occur as part of the Project activities at this facility.

Proposed activities at Station 165 would occur over approximately 82.1 acres of land including 72.1 acres temporarily disturbed during construction and 10.0 acres permanently disturbed for use during operation. Following construction, forested areas, aside from approximately 7.1 acres of planted pine, would be allowed to revert to pre-existing conditions to the extent practicable and in accordance with specific requirements identified by state or federal agencies with regulatory jurisdiction over or interest in private forest land. The re-growth of forested areas could take many years, therefore, these impacts are considered long-term, but minor, given the abundance of forested land in the Project vicinity. Transco would preserve as much tree cover around the fenced compressor station site as possible. Approximately 9.9 acres of open lands would be temporarily disturbed during construction and allowed to revert to pre-existing conditions to the extent practicable.

The Project would result in a relatively small amount of permanent land conversion and Transco would follow its Plan and Procedures for restoration and maintenance. Transco would restore disturbed areas not needed for operations. Therefore, we conclude that impacts on land use from the Project would be not be significant.

5.2 Existing Residences and Planned Developments

Two residences were identified within 50 feet of the construction work area; one approximately 28 feet southwest of MP 1569.4 and one approximately 40 feet north of MP 1574.2. Negotiations with landowners of the residential and commercial properties within 50 feet of the construction work area are on-going. Transco developed site-specific construction plans to mitigate potential impacts for these residences (appendix D). We reviewed these site-specific plans and find them acceptable. Comments on these site-specific plans may be submitted to FERC as described in the Letter to Interested Parties.

Appropriate measures to protect existing residential and commercial structures would be established with the respective landowners prior to construction of the Project. Such measures may include avoiding removal of mature trees, immediately restoring lawn areas after backfilling the trench, fencing the construction work area throughout the open trench phase of construction, using stove-pipe or drag-section construction techniques, reducing pipeline separation to stay farther from residence, purchasing a residence or structure, and other site-specific measures to be determined on a case-by-case basis.

County and local planning agencies within the counties crossed by the Project and counties within 0.25 mile of Project activities were contacted to identify planned residential or commercial developments that would be crossed or within 0.25 mile of the construction work area. No planned residential or commercial areas within 0.25 mile of the Project activities were identified.

With implementation of Transco's Plan and Procedures and site-specific residential construction plans, we conclude that the Project would have a minimal impact on existing residences.

5.3 Property Values

We received a comment about potential adverse effects on property values resulting from construction and operation of a meter station. The potential impact of a pipeline and associated infrastructure on the value of a tract of land is related to many tract-specific variables, including the size of the tract, the current value of the land, the utilities and services that are available or accessible, the current land use, and the value of adjacent properties. Land values are determined by appraisals that would consider objective characteristics of the property such as size, location, and any improvements. While there is recently published literature indicating that there is no identifiable or consistent link between the presence of natural gas pipeline easements or compressor stations and residential property values (Diskin et al. 2011, Foster 2016), valuation is subjective and is generally not considered in appraisals. The presence of a pipeline and associated infrastructure and the restrictions associated with a pipeline easement could influence a potential buyer's decision to purchase a property. If a buyer is looking for a property for a specific use that the presence of the pipeline renders infeasible, then the buyer may decide to purchase another property more suitable to their objectives. For example, a buyer wanting to develop the land for a commercial property with subsurface structures would likely not find the property suitable, but farmers looking for land for grazing or additional cropland could find it suitable for their needs. This would be similar to other buyer-specific preferences that not all homes have, such as close proximity to shopping or access to high quality school districts.

Transco would compensate landowners for new easements along the pipeline routes and at the aboveground facilities, where applicable, as well as the temporary loss of land use associated with construction workspaces and any damages. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for facility construction and operation.

Based on the findings previously described in published literature and the subjective nature of property valuations, we conclude the Project would have no significant impact on property values.

5.4 Public Land, Recreation, and Other Designated Areas

Locations of public lands, recreation areas, and other designated special use areas were identified by reviewing available data sources and contacting regulatory agencies and landowners. Electronic files were obtained from the Virginia Department of Conservation and Recreation – Natural Heritage Division (VDCR-NHD) to determine if any conservation lands were crossed or within 0.25 mile of the Project. These files included records from the following agencies, organizations, or programs:

- National Park Service
- United States Forest Service
- United States Fish and Wildlife Service
- Natural Resources Conservation Service
- Virginia Outdoors Foundation
- Virginia Department of Conservation and Recreation
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Forestry
- Virginia Department of Defense Lands
- Virginia Department of Forestry Lands

- Locally Managed Conservation Lands
- Privately Owned Conservation Lands
- Virginia Scenic Rivers
- The Natural Conservancy Managed Lands
- USDA Forest Service Managed Lands
- Virginia Marine Resources Commission Lands
- Conservation Lands in Virginia
- Virginia Easements

The Project crosses approximately 5.7 acres of land (between MP 1569.2 and MP 1569.5) falling within a Fauquier County Purchase of Development Rights (PDR) Easement. This private easement is part of the Fauquier County PDR Program and is administered by the Fauquier County Agricultural Development Department. This program ensures that land remains in agricultural production and that future generations will be able to farm the land. Transco has continued to coordinate with the landowner and Fauquier County for the temporary construction and revised maintained easement on this property. Following construction, agricultural practices on this property should be able to continue given that tree production is not currently occurring within the Project workspaces. Therefore, significant impacts on land falling under the Fauquier County PDR Program are not anticipated.

5.5 Natural or Scenic Areas

The Project does not cross designated natural or scenic areas. No Virginia Scenic Rivers (VDCR-NHD 2018), Nationwide Rivers Inventory (NPS 2018), or National Wild and Scenic Rivers segments (Rivers 2018) are crossed or located within 0.25 mile of the Project areas. Therefore, we conclude that impacts on natural or scenic areas would not be significant.

5.6 Special Land Uses

No sugar maple stands, orchards, nurseries, specialty crops, remnant prairies, old growth forests, registered natural landmarks, areas of critical environmental concern, wilderness areas designated under the Wilderness Act, wilderness study areas, National Primitive Areas, National Scenic Areas, National Scenic Research Areas, National Wild and Scenic Rivers, National Recreation Areas, National Game Refuges and Wildlife Preserves, National Monument Areas, National Volcanic Monument Areas, National Historic Areas, National Forests, National Protection Areas, Special Management Areas, Natural Botanical Areas, Recreation Management Areas, Scenic Recreation Areas, Scenic Wildlife Areas, or other designated natural areas, are located within 0.25 mile of the proposed disturbance area (VDCR-NHD 2018). Therefore, we conclude that impacts on recreational opportunities and special interest areas would not be significant.

5.7 Coastal Zone Management Areas

The portion of the Manassas Loop in Prince William County (between MP 1573.1 and MP 1575.9) is within Virginia Coastal Zone overseen by the Virginia Coastal Zone Management (CZM) Program lead by the VDEQ. Federal consistency reviews are integrated into other review processes conducted by the state of Virginia depending on the type of federal action being proposed. Consistency reviews of federal permits issued under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act are conducted as part of the Joint Permit Application (JPA) process. The JPA is used in Virginia to obtain corresponding authorizations from the USACE Norfolk District, Virginia Marine

Resources Commission (VMRC), VDEQ, and/or Local Wetlands Boards (USACE 2018a). The VMRC acts as the interagency clearinghouse for JPAs (USACE 2018a).

The USACE received comments from the VDEQ on April 5, 2017 concurring that the use of the 2017 Nationwide Permits are consistent with the Virginia CZM Program provided certain conditions are followed (USACE 2018b). Transco intends to submit a pre-construction notification (PCN) to the USACE for use of Nationwide Permit No. 12 (Utility Line Activities) and follow general and applicable regional conditions pertaining to Section 401 Water Quality Certification and Coastal Zone Management Act Consistency Determinations. In the event the USACE determines that an Individual Permit is required for the Project, a project-specific coastal zone consistency would be requested by the VDEQ. The status of the coastal zone consistency determination for the Project would be confirmed following submittal of the JPA.

To ensure the Project is consistent with CZMA, **we recommend that:**

- **Prior to construction, Transco should file with the Secretary the Nationwide Permit No. 12 for the Project, which serves as documentation that the Project is consistent with the Virginia CZM Program, or a copy of the determination of consistency with the CZM Program issued by the VDEQ.**

With Transco's implementation of measures contained in its USACE and VDEQ permits and our recommendation, impacts on Coastal Zone Management Areas would be sufficiently minimized.

5.8 Visual Resources

Pipeline Facilities

The Manassas Loop would be co-located with the existing Transco Mainline C pipeline for the majority of the route. The primary impacts of the pipeline facilities on visual resources would occur during active construction. No visually sensitive areas were identified during review of the Project's pipeline facilities. The impacts would include the presence of construction equipment, materials, and personnel, and disturbance of vegetation and soils. These construction impacts would be temporary. During restoration of the disturbed areas, the rights-of-way would be characterized by mixed areas of new vegetation and bare soils. Revegetation of the rights-of-way would be expected to begin shortly after construction. In co-located areas, the permanent right-of-way would result in an increase in the overall right-of-way width, but would be consistent with existing conditions and have minimal visual impacts.

Following construction, Transco would fully restore all disturbed areas. Construction would have a permanent impact on some forested lands. Furthermore, clearing of forested lands for the permanent easement would result in a permanent visual change, as these areas would be maintained in an herbaceous state.

Aboveground Facilities

The aboveground facilities associated with the Project would represent a minimal change in visual conditions. The aboveground facilities associated with the Project would be located within the property boundaries existing industrial facilities owned by Transco. Transco has not proposed any new visual screening for its aboveground facilities; however, it would leave existing trees and vegetation in place along roadways to buffer the view of the new buildings. To a casual observer or passerby, no significant visual changes would be expected once these facilities are complete. In addition, new

buildings would be constructed at Station 165 and 175 only. New buildings associated with Station 165 and 175 would be located 1,150 feet southeast and 510 feet northeast, respectively, at the closest points from the nearest sensitive visual areas (residences).

Project activities at Station 165 would occur adjacent to the existing Station 165 boundaries and a forested buffer would be retained around the facilities to the extent practicable to reduce visibility from nearby receptors. In addition, the proposed building height would be 6 feet shorter than the tallest existing building on the property. Project activities at Station 175 would occur adjacent to the existing building on the property. The proposed compressor station building would be 2.5 feet shorter than the existing building onsite and would be partially shielded from visual receptors by the existing compressor station building. Although, the addition of the new building would be a change from the current viewshed, the building would be consistent with the existing building on the property. Therefore, the addition of buildings at Station 165 and 175 would not significantly affect visual resources.

6.0 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation an opportunity to comment. Transco, as a non-federal party, is assisting the FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR Part 800.

Transco conducted a cultural resources survey for the Virginia portion of the Project, and provided the resulting *Phase I Cultural Resource Identification Survey* report (Phase I report) to the FERC and Virginia State Historic Preservation Officer (SHPO). The survey employed surface inspection augmented by excavation of 3,425 shovel test units and metal detector survey, and included both archaeological and historic resources. Approximately 426.3 acres were surveyed for archaeological resources including a 300-foot-wide corridor for the pipeline looping, a contractor yard, a staging area, extra workspace (including at Station 165), and access roads (50-foot-wide corridor). Because no impacts would occur outside the existing fenced facility, no survey was undertaken at Stations 175 and 185. For aboveground resources, the study area included a 600-foot-wide corridor along the loop route, a half-mile buffer around Station 165, and areas from which the Project would be visible at each end of the loop.

As a result of survey, 15 newly recorded archaeological sites and 24 archaeological locations (where only one or two artifacts were identified) were identified. The 15 sites included 2 pre-contact lithic scatters, 8 historic sites (4 artifact scatters, 2 refuse scatters, a farmstead/possible Civil War encampment, and the remains of an historic dairy farm), and 5 sites with both pre-contact and historic components (4 lithic scatters/historic artifact scatters, and one lithic scatter/house site). Of the 15 sites, one (44FQ343 – a lithic scatter/historic artifact scatter) was recommended as potentially eligible for the NRHP, and two (44FQ342 - the farmstead/possible Civil War encampment, and 44FQ345 - an historic artifact scatter) required additional information to provide NRHP recommendations. Phase II site evaluation testing was recommended for these three sites. The remaining 12 sites and 24 archaeological locations were recommended as not eligible for the NRHP. In a letter dated August 10, 2018, the Virginia SHPO concurred with the recommendations in the survey report, but requested minor revisions to the report. Transco provided a revised Phase I identification report to the FERC and SHPO. In a letter dated January 3, 2019, the SHPO indicated that the revised report addressed its comments.

Transco provided a *Phase II Archaeological Testing* report (Phase II site evaluation report) for archaeological sites 44FQ0342, 44FQ0343, and 44FQ0345 to the FERC and SHPO. As a result of Phase

II testing, due to the limited findings, all three sites were recommended as not eligible for the NRHP. In a letter dated January 4, 2019, the SHPO concurred. We concur also.

The survey also identified 61 architectural resources within the study area in Virginia including 53 historic structures (30 single dwellings, 15 farms, 1 church, 1 multi-family dwelling, 1 commercial building, 2 single dwelling/commercial buildings, 1 shed, 1 compressor station, and 1 single dwelling/farm); 4 districts (Calverton Historic District, Auburn Battlefield Historic District, Elk Run-Germantown-Cedar Run Rural Historic District, and Rappahannock Station 1 Battlefield Historic District); 1 road (Old Dumfries Road); 1 railroad (Orange and Alexandria Railroad), and 2 cemeteries.

The Calverton Historic District and Auburn Battlefield Historic District are listed on the NRHP. The Elk Run-Germantown-Cedar Run Rural Historic District and Rappahannock Station 1 Battlefield Historic District have been previously determined eligible for the NRHP. One of the farms, the W.B.G. Shumate Farm (030-5843) lies within the Elk Run-Germantown-Cedar Run Rural Historic District and was recommended as potentially eligible as an individual property under NRHP criteria A, B, and C, and a contributing resource to the district. The Orange and Alexandria Railroad was considered potentially eligible under NRHP criteria A and C, and a contributing resource to the Rappahannock Station 1 Battlefield Historic District. Old Dumfries Road was considered eligible under NRHP criterion A, and a contributing resource to the Auburn Battlefield Historic District. Thirteen properties eligibility was not assessed due to lack of access or information. Five of these however, were recommended as contributing elements to the Elk Run-Germantown-Cedar Run Rural Historic District. Eighteen resources were recommended as individually ineligible, but contributing to the Elk Run-Germantown-Cedar Run Rural Historic District and/or Calverton Historic District. The remaining resources were recommended as not eligible for the NRHP either individually or as part of a district.

In its August 10, 2018 letter, the Virginia SHPO concurred with the eligibility recommendations in the report with the exception of the Shumate Farm, which the SHPO considered was eligible under criteria A and C, but not B; one of the farms, which the SHPO indicated should be considered a contributing element to the Elk Run-Germantown-Cedar Run Rural Historic District; and 6 of the eligibility not accessed resources, which the SHPO indicated were not eligible, and recommended that 6 of the inaccessible properties be treated as eligible. The SHPO also requested a revised report be submitted. Transco provided a revised report to the FERC and SHPO. In its January 3, 2019 letter, the SHPO indicated that the revised report addressed its comments.

Transco also provided an addendum Phase I identification report covering a revised access road location and extra workspace along the Manassas Loop, and extra workspace at Compressor Station 175. As a result of the survey, one new archaeological site, evidence of a Civil War Union Army campsite as well as 19th-20th century farming activity (44FQ0358) was identified. Due to disturbance and the limited amount of material at the site, it was recommended as not eligible for the NRHP. The revised access road is within the boundaries of the W.G.B Shumate Farm property (noted above), and both the access road and extra workspace lie within the Elk Run Cedar Run Rural Historic District. Two architectural resources older than 50 years, both residences, were identified as being visible from the Compressor Station 175 workspace. Both of these were previously determined as not eligible for the NRHP. In a letter dated January 3, 2019, the SHPO concurred, and recommended that Transco complete an effects assessment for potential impacts on NRHP eligible resources.

All four of the historic districts, the Orange and Alexandria Railroad, Old Dumfries Road, and the W.G.B. Shumate Farm would be crossed by the Manassas Loop. Proposed access roads would also cross the districts, and the revised access road noted above would cross a field of the W.G.B. Shumate Farm. While all of the remaining identified structures and the cemeteries would be avoided, portions of their

associated properties, in some cases, would be crossed by the loop or access roads. Transco prepared an “Assessment of Effects” for the listed, eligible, contributing, and eligibility not accessed resources. As a result of the assessment, because the Project consists of looping; the Project area has been previously altered by installation of numerous pipelines; there would be only minor visual effects; access roads are either existing, or temporary and would be restored; and the railroad and Dumfries Road would be avoided by boring; the assessment recommended that the Project would have no adverse effect on historic properties. Transco has not yet provided the SHPO’s comments on the assessment. Therefore, **we recommend that:**

- **Transco should not begin construction of facilities or use of staging, storage, or temporary work areas and new or to-be-improved access roads until:**
 - a. **Transco files with the Secretary:**
 - (1) **the Virginia SHPO’s comments on the “Assessment of Effects”, and**
 - (2) **any required avoidance and/or treatment/mitigation plans, and the Virginia SHPO’s comments on the plans;**
 - b. **the Advisory Council on Historic Preservation is afforded an opportunity to comment if historic properties would be adversely affected; and**
 - c. **the FERC staff reviews and the Director of OEP approves the cultural resources reports and plans, and notifies Transco in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.**

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: “CUI//PRIV – DO NOT RELEASE.”

Transco contacted the South Carolina, Georgia, and Louisiana SHPOs regarding the Project components in those states, providing a Project description and mapping. In a letter dated October 18, 2018, the South Carolina SHPO indicated that no properties listed in or eligible for listing in the NRHP would be affected by the Project. In a letter dated October 18, 2018, the Georgia SHPO indicated that no historic properties listed in or eligible for listing in the NRHP would be affected by the activities at Station 115, the Savannah River Interconnect, the MLVs, and that for the remainder of the Project components in Georgia, that the Project would have no adverse effect on historic properties. On October 9, 2018, the Louisiana SHPO indicated that no known historic properties would be affected by the Project. We concur with the SHPOs.

Transco contacted the following Native American tribes, providing a Project description and mapping, and followed-up with the tribes, as necessary: Absentee-Shawnee Tribe of Oklahoma; Catawba Indian Nation; Cherokee Nation of Oklahoma; Delaware Nation; Delaware Tribe of Indians; Eastern Band of Cherokee Indians; Eastern Shawnee Tribe of Oklahoma; Oneida Tribe of Indians of Wisconsin; Oneida Indian Nation of New York; Pamunkey Indian Tribe; Shawnee Tribe; Tuscarora Nation; and United Keetoowah Band of Cherokee Indians of Oklahoma.

On March 26, 2018, the Shawnee Tribe concurred that no known historic properties would be negatively impacted by the Project, but requested to be notified of discoveries during construction. On April 2, 2018 the Pamunkey Tribe requested an electronic copy of Transco’s introductory letter, which

Transco provided. The Pamunkey Tribe also indicated that it was not aware of any site of cultural or religious importance that would be affected by the Project, but requested to be notified in the event of an unanticipated discovery. On April 3, 2018, the Delaware Nation concurred with the Project, requested to be a consulting party, provided information for the avoidance and protection of sites, and requested to be contacted in the event of discoveries. In a letter dated April 20, 2018, the Catawba Indian Nation indicated it had no immediate concerns, but requested to be notified of discoveries during construction. In a letter dated April 11, 2018, the Cherokee Nation of Oklahoma indicated that, after a check of its records, it found no instances of the Project intersecting its resources; requested to be notified of discoveries during construction; and requested other pertinent tribes be contacted. The Unanticipated Discovery Plan (see below) provides for notification of interested tribes in the event of a discovery.

We sent our NOI to these same tribes. In a letter dated May 16, 2018, the Choctaw Nation of Oklahoma requested GIS shapefiles of the Project, which Transco provided. On July 2, 2018, the Cherokee Nation of Oklahoma indicated that the Project occurred in counties of interest to the tribe in Georgia (Madison and Walton) and South Carolina (Anderson and Spartanburg), requested to be a consulting party, requested Project information and the reports, and requested other pertinent tribes be contacted. Transco indicated it would provide the tribe updated figures following workspace layout evaluation. No other responses to our NOI have been received from the tribes.

Transco also contacted the Prince William County Archaeologist and the Fauquier County Preservation Planner. Upon review of the Project research design, the Prince William County Archaeologist had no issues with the field methodology, but recommended implementing metal detecting on battlefield sites, and also requested that any artifacts discovered in Prince William County be curated at the Prince William County facility. The Fauquier County Preservation Planner requested a copy of the Project research design, which Transco provided. Transco provided both parties with the Phase I identification and Phase II evaluation reports. Consultation is ongoing.

Transco provided a plan to address the unanticipated discovery of cultural resources and human remains during construction. We requested minor revisions to the plan. Transco provided a revised plan which we found acceptable.

7.0 AIR QUALITY AND NOISE

7.1 Air Quality

Federal and state air quality standards are designed to protect human health. The EPA has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants such as oxides of nitrogen (NO_x) and carbon monoxide (CO), sulfur dioxide (SO₂), and inhalable particulate matter (PM_{2.5} and PM₁₀). PM_{2.5} includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM₁₀ includes particles with an aerodynamic diameter less than or equal to 10 micrometers. The NAAQS were set at levels the EPA believes are necessary to protect human health and welfare. Volatile organic compounds (VOC) are regulated by EPA mostly to prevent the formation of ozone, a constituent of photochemical smog. Many VOCs form ground-level ozone by reacting with sources of oxygen molecules such as NO_x in the atmosphere in the presence of sunlight. NO_x and VOCs are referred to as ozone precursors. Hazardous air pollutants are also emitted during fossil fuel combustion and are suspected or known to cause cancer or other serious health effects; such as reproductive effects or birth defects; or adverse environmental effects.

Greenhouse Gases (GHG) produced by fossil-fuel combustion are carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). GHGs status as a pollutant is not related to toxicity. GHGs are non-toxic

and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHG under the Clean Air Act. GHGs emissions due to human activity are the primary cause of increased atmospheric concentration of GHGs since the industrial age. These elevated levels of GHGs are the primary cause of warming of the climatic system. These existing and future emissions of GHGs, unless significantly curtailed, will cause further warming and changes to the local, regional and global climate systems.

During construction and operation of the Project, these GHGs would be emitted from construction equipment and fugitive emissions. Emissions of GHGs are typically expressed in terms of CO₂ equivalents (CO_{2e}).

If measured ambient air pollutant concentrations for a subject area remain below the NAAQS criteria, the area is considered to be in attainment with the NAAQS. The Project areas in Prince William County, VA is in marginal non-attainment status for the 8-hour ozone standard and in Coweta County, GA in maintenance status for the 8-hour ozone standard.

The Clean Air Act is the basic federal statute governing air pollution in the United States. We have reviewed the following federal requirements and determined that the regulation below are applicable to the proposed Project:

- New Source Review;
- Title V;
- National Emissions Standards for Hazardous Air Pollutants;
- New Source Performance Standards;
- Greenhouse Gas Reporting Rule; and
- General Conformity of Federal Actions.

Due to the aggregation determination made on Compressor Station 165 located in Pittsylvania County, the VDEQ has determined that Compressor Station 166, which is not included in the Southeastern Trail Project, is in common control and adjacent to Compressor Station 165 and should both be treated as one facility for air permitting purposes. Because of this determination, the combined emissions trigger the above regulation. And as part of the VDEQ's permitting process, Transco will have to comply with all applicable regulations in order to receive an operating permit from the State of Virginia.

Construction Impacts

During construction, a temporary reduction in ambient air quality may result from criteria pollutant emissions and fugitive dust generated by construction equipment. The quantity of fugitive dust emissions would depend on the moisture content and texture of the soils that would be disturbed. Fugitive dust and other emissions due to construction activities generally do not pose a significant increase in regional pollutant levels; however, local pollutant levels could increase. Dust suppression techniques, such as watering the right-of-way may be used as necessary in construction zones near residential and commercial areas to minimize the impacts of fugitive dust on sensitive areas. The Project construction emissions are presented in table 22.

Table 22							
Construction Emissions (tons/year)							
County/State	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}	GHG (as CO _{2e})
Fauquier County, VA	24.9	24	2.7	0.04	15.9	5.6	8,171.6
Prince William County, VA	8.3	8	0.9	0.01	5.3	1.9	2725.2
Fluvanna County, VA	10.3	22.7	1.6	0.02	7.2	2.4	3710.5
Pittsylvania County, VA	10.3	23	1.6	0.02	8.1	2.6	3741.6
St. Helena Parish, LA	6.5	9.5	0.9	0.01	4.8	1.6	2435.5
Spartanburg County, SC	7.5	10.2	1	0.01	10.5	3.9	2,852.40
Coweta County, GA	8.4	10.5	1.1	0.01	9	3.3	3177.7
Total	76.2	107.9	9.8	0.12	60.8	21.3	26,814.5

These emissions represent the combined emissions of construction equipment combustion, on-road vehicle travel, off-road vehicle travel, and earthmoving fugitive dust. Construction related emission estimates were based on a typical construction equipment list, hours of operation, and vehicle miles traveled by the construction equipment and supporting vehicles for each area of the Project. Emission factors for construction equipment were based on MOVES20114a emission estimates.

Operational Impacts

The proposed Manassas Loop Bidirectional Pig Launcher/Receivers, Compressor Station 165, and modifications to Compressor Station 165, and Compressor Station 175 would have some fugitive emissions. Emissions from the proposed Project facilities are shown below in table 23.

Table 23							
Operational Emissions (tons/year)							
County/State	NO _x	CO	VOC	SO ₂	PM ₁₀	PM _{2.5}	GHG (as CO _{2e})
Compressor Station 165	182.3	207	35.4	12	23.3	23.3	428,920.8
Compressor Station 175	95.3	104	18.4	3	11.72	11.72	216235.6
Manassas Loop Bidirectional Pig Launches/Receivers	--	--	0.08	--	--	--	169.6
Total	277.6	311	53.88	15	35.02	35.02	645,326

These emissions would not have a significant impact on ambient air quality and would not contribute to an exceedance of any air quality standards.

Conclusion

Based on the short duration of construction activities, our review of the estimated emissions from construction of the proposed Project, we do not believe there would be regionally significant impacts on air quality.

7.2 Noise

The noise environment can be affected both during construction and operation of pipeline projects. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures to relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 decibels on the A-weighted scale (dBA) added to account for people's greater sensitivity to nighttime sound levels (between the hours of 10 p.m. and 7 a.m.). The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise.

Construction Noise

Construction noise is highly variable. Many construction machines operate intermittently, and the types of machines in use at a construction site change with the construction phase. The sound level impacts on residences along the pipeline right-of-way due the construction activities would depend on the type of equipment used, the duration of use for each piece of equipment, the number of construction vehicles and machines used simultaneously, and the distance between the sound source and receptor. Nighttime noise due to construction would be limited since construction generally occurs during daylight hours, Monday through Saturday.

Blasting may be required during construction where hard, non-rippable bedrock is encountered within the trench profile. Blasting would be subject to the following federal and state regulations: Occupational Safety and Health Administration, 29 CFR Part 1926, Subpart U, Safety and Health; Bureau of Alcohol, Tobacco, Firearms and Explosives, 27 CFR Part 181, Storage, Security, and Accountability, USDOT, 49 CFR Parts 171-179, 390-397, Shipment; and once call Notification when blasting near utilities. Alternate mechanical methods would be employed initially to attain the desired trench depth, such as ripping or the use of hydraulic hammers or rock saws. Blasting would be limited to daylight hours and Transco would implement procedures in its Blasting Plan to mitigate any impacts from blasting.

Operational Noise

Noise would generally be produced on a continuous basis at the compressor stations by the compressor units and associated equipment. A noise analysis was completed for all aboveground facilities. Table 24 shows the increase in noise levels due to the modifications at each compressor station.

To ensure that the actual noise levels resulting from operation of Compressor Station 185 do not exceed current noise levels, **we recommend that:**

- **Transco should file with the Secretary a noise survey for Compressor Station 185 no later than 60 days after placing the modified unit in service. If full power load condition noise survey is not possible, Transco should file an interim survey at the maximum possible power load within 60 days of placing the modified unit into service and file the full power load survey within 6 months. If the noise attributable to operation of all equipment at the station under interim or full power load conditions**

exceeds the previously existing noise levels that are at or above an Ldn of 55 dBA at the nearby NSAs, Transco should:

- a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;
- b. implement additional noise control measures to reduce the operating noise level at the noise-sensitive areas to or below the previously existing noise level within 1 year of the in-service date; and
- c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary no later than 60 days after it installs the additional noise controls.

Table 24						
Noise Levels at NSAs, Sound level Ldn (dBA)						
Project Facility	Nearest Noise Sensitive Areas (NSAs)	Distance and Direction from Project Facility (feet)	Current Sound Level Ldn (dBA)	Estimated Sound Level of New Compressor Units Ldn (dBA)	Estimated Total Sound Level After Project Modifications Ldn (dBA)	Potential Increase from Current Sound Level (dB)
Compressor Station 185	NSA No. 1 (Residence)	770 (NNW)	67.7/46.3	47.1	67.7	--
	NSA No. 2 (Residence)	930 (N)	70.1/44.1	44.9	70.1	--
	NSA No. 3 (Residence)	1,140 (SSE)	53.5/40.6	41.4	53.8	0.3
Compressor Station 175	NSA No. 1 (Residence)	510 (NE)	51.3	49.3	54.1	2.8
	NSA No. 2 (Residence)	650 (N)	53.8	47.4	55.5	1.7
	NSA No. 3 (Residence)	800 (W)	54.7	44.3	56	1.3
Compressor Station 165	NSA No. 1 (Residence)	1,150 (SE)	48.8	40.4	49.4	0.6
	NSA No. 2 (Residence)	1,800 (NW)	46.6	48.3	50.6	4

To ensure that the actual noise levels resulting from operation of Compressor Station 175 and Compressor Station 165 meet our noise criteria, **we recommend that:**

- **Transco should file noise surveys with the Secretary no later than 60 days after placing the authorized units at Compressor Station 175 and Compressor Station 165**

in service. If a full power load condition noise survey is not possible, Transco should file an interim survey at the maximum possible power load within 60 days of placing the authorized units into service and file the full power load survey within 6 months. If the noise attributable to operation of all equipment at the stations under interim or full power load conditions exceeds an Ldn of 55 dBA at any nearby NSAs, Transco should:

- a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;**
- b. install additional noise controls to meet that level within 1 year of the in-service date; and**
- c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Conclusion

Given the temporary nature of construction activities, and based on our analysis and Transco's compliance with our recommendations, the Project's construction and operational noise levels would not result in significant impacts on the existing environment.

7.3 Reliability and Safety

The pressurization of natural gas at a compressor station involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a leak, or rupture at the facility. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an auto-ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

Safety Standards

The USDOT is mandated to provide pipeline safety under Title 49 USC Chapter 601. The USDOT's Pipeline and Hazardous Materials Safety Administration administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. The Pipeline and Hazardous Materials Safety Administration ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level.

The USDOT provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. A state may also act as USDOT's agent to inspect interstate facilities within its boundaries; however, the USDOT is responsible for enforcement actions. The USDOT pipeline standards are published in Title 49 CFR Parts 190-199. Part 192 specifically addresses natural gas pipeline safety issues.

The USDOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the USDOT in accordance with Section 3(e) of the Natural Gas Pipeline Safety Act. Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993, between the USDOT and the FERC, the FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert the USDOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the USDOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the USDOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The USDOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

The USDOT also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

- | | |
|---------|--|
| Class 1 | Location with 10 or fewer buildings intended for human occupancy. |
| Class 2 | Location with more than 10 but less than 46 buildings intended for human occupancy. |
| Class 3 | Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period. |
| Class 4 | Location where buildings with four or more stories aboveground are prevalent. |

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For instance, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2,

3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (e.g., 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; maximum allowable operating pressure (MAOP); inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the Project have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. Based on the based on population density in the vicinity of the pipeline, the Project would fall under a Class 2 and 3 designation for the Manassas Loop. Transco has committed to building the pipeline to meet Class 2 and 3 standards in the applicable locations.

If a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline, Transco would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the USDOT requirements for the new class location.

The USDOT Pipeline Safety Regulations require operators to develop and follow a written integrity management program that contain all the elements described in 49 CFR 192.911 and address the risks on each transmission pipeline segment. The rule establishes an integrity management program which applies to all high consequence areas (HCA).

The USDOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for USDOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high density population area.

The HCAs may be defined in one of two ways. In the first method an HCA includes:

- current class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle; or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

In the second method, an HCA includes any area within a potential impact circle which contains 20 or more buildings intended for human occupancy, or an identified site.

Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The USDOT regulations specify the requirements for the integrity management plan at section 192.911. The pipeline integrity management rule for HCAs requires inspection of the pipeline HCAs every 7 years.

The USDOT prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards of a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people first and then property, and making them safe from actual or potential hazards.

The USDOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Transco would provide the appropriate training to local emergency service personnel before the pipeline is placed in service.

Conclusion

Transco's construction and operation of the Project would represent a minimum increase in risk to the nearby public and we are confident that with implementation of the standard safety design criteria, that the Project would be constructed and operated safely.

8.0 CUMULATIVE IMPACTS

In accordance with NEPA, we identified other actions located in the vicinity of the proposed Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by the Council on Environmental Quality (CEQ), a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. The CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects within defined geographic scopes as part of the affected environment (environmental baseline) which was described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered. We have evaluated the cumulative impacts of the proposed Project consistent with other recent assessments issued by the Commission, and in accordance with recommended CEQ and EPA methodologies (CEQ 1997; EPA 1999). The EPA also recommended that we follow the cumulative impacts analysis methodology Guidance for Preparers of Cumulative Impact Analysis developed jointly by the EPA, the Federal Highway Administration, and the California Department of Transportation to assess cumulative impacts for the proposed Project.

Our cumulative effects analysis focuses on potential impacts from a proposed Project on resource areas or issues where the incremental contribution could result in cumulative impacts when added to the

potential impacts of other actions. To avoid unnecessary discussions of insignificant impacts and projects and to adequately address and accomplish the purposes of this analysis, an action must first meet the following three criteria to be included in the cumulative analysis:

- affects a resource also potentially affected by the Project;
- causes this impact within all, or part of, the Project area defined by the resource-specific geographic scope; and
- causes this impact within all, or part of, the time span of the proposed Project's estimated impacts.

For this analysis, we focused on the Manassas Loop and Stations 185, 175 and 165 given impacts at the other facilities would occur within the existing facility footprints, would not impact wetlands or waterbodies, and would not involve tree clearing. As described in section B of this EA, constructing and operating the Project would temporarily and permanently impact the environment. The Project would impact geology, soils, water resources, wetlands, vegetation, fish, wildlife, some land uses, visual resources, air quality, and noise. However, throughout section B of this EA, we determined that the proposed Project would have only minimal or temporary impacts on these resources. We also concluded that nearly all of the Project-related impacts would be contained within or adjacent to the temporary construction right-of-way and ATWS. For example, erosion control measures included in Transco's E&SC Plan and Plan would keep disturbed soils within work areas. For other resources, the contribution to regional cumulative impacts is lessened by the expected recovery of ecosystem function. For example, vegetative communities would be cleared, but restoration would proceed immediately following construction. Additionally, we determined that air quality and noise impacts during construction would be temporary and that operation of the Project would not result in significant air emissions or changes to operational noise associated with Transco's pipeline system.

Consistent with the CEQ guidance and to determine whether cumulative impacts would occur, we reviewed the impact of projects within resource-specific geographic scopes. Table 25 below summarizes the resource-specific geographic scopes that were considered in this analysis. Actions located outside the geographic scope are generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

Table 4 of appendix 3 identifies present and reasonably foreseeable projects or actions that occur within the geographic scope for each resource. These projects were identified by a review of publicly available information; aerial and satellite imagery; consultations with federal, state, and local agencies/officials and development authorities; and information provided by Transco, affected landowners, and concerned citizens.

The other actions considered in our cumulative impact analysis vary from the Project in nature, magnitude, and duration. These actions are included based on the likelihood of completion near the proposed construction time span, and only projects with either ongoing impacts or that are "reasonably foreseeable" future actions were evaluated. Existing or reasonably foreseeable future actions that would be expected to affect similar resources during similar periods as the Project were considered further. The anticipated cumulative impacts of the Project and these other actions are discussed below, as well as any pertinent mitigation actions.

Table 25	
Resource-Specific Geographic Scopes	
Resource	Cumulative Impact Geographic Scope
Geology and Soils	Project area of disturbance and other activities that would be overlapping or abutting each other
Water Resources, Wetlands, and Fisheries	Hydrologic Unit Code (HUC)-12 watershed boundary
Vegetation and Wildlife, Threatened and Endangered Species	Hydrologic Unit Code (HUC)-12 watershed boundary
Land Use, Visual, and Recreation	1-mile radius
Cultural Resources	Project area of disturbance
Air Quality – Operations	10-mile radius around Station 175 and Station 165
Air Quality – Construction	0.25 mile radius around the primary construction areas (station 185, Station 175, Station 165, and the Manassas Loop)
Noise	Area 0.25-mile around Project sites (Manassas Loop, Station 185, Station 175, and Station 165)

We received a comment that all upstream and downstream impacts should be assessed for each project under FERC jurisdiction. No past, present, or reasonably foreseeable natural gas production wells or associated gathering line developments within the geographic scope were identified. Consistent with previous Commission Orders, although any known production wells or gathering lines would have been considered under cumulative impacts, if planned, it is unknown when, or even if, these wells would be drilled. An in-depth analysis of Marcellus Shale wells is outside the scope of the analysis in this EA because the exact location, scale, and timing of these facilities are unknown. No downstream uses for the gas that would be transported by this Project are known at this time.

8.1 Identified Projects

The first European settlements in Virginia date back to 1606 or 1607. However, indigenous peoples have occupied the region for at least 12,000 years (Wood 2007). Currently, the state is the twelfth most populated state in America (U.S. Department of Commerce 2015). Consequently, the natural environment has been modified numerous times over a very long period of occupation. These impacts are generally considered as part of the “baseline” throughout our analysis, and we focus on analyzing projects that have a potential to result in cumulative effects. Based on the geographic scopes described above for cumulative impacts, we identified 13 projects that were considered in the cumulative impact assessment.

The following projects listed in table 4 of appendix C are further considered in the analysis of cumulative impacts:

- The Virginia Department of Transportation’s (VDOT) Route 15/17/29 Warrenton Interchange (Route 15/17/29 Warrenton Interchange);

- Fauquier County’s Fauquier Central Complex (Fauquier Central Complex);
- Ven Metre Companies’ Cunningham Farm and Carter’s Crossing (Cunningham Farm and Carter’s Crossing);
- Dominion’s New Lines 2086 and 2155 (New Lines 2086 and 2155);
- VDOT’s I-66 and Route 15 Interchange Reconstruction (I-66 and Route 15 Interchange Reconstruction);
- Prince William County Vint Hill Road Extension (Vint Hill Road Extension);
- Dominion New Line 2174 (New Line 2174);
- Fluvanna County’s Farm Heritage Museum (Farm Heritage Museum);
- VDOT’s Route 53 and Route 618 (Route 53 and Route 618);
- EQT Midstream Partners’ and Mountain Valley Pipeline, LLC’s Mountain Valley Pipeline (MVP);
- VDOT’s U.S. Route 29 South over Norfolk Southern Railroad (U.S. Route 29 South over Norfolk Southern Railroad);
- Mountain Valley Pipeline (MVP), LLC’s MVP and MVP Southgate, and
- Transco’s Virginia Southside Expansion (Virginia Southside Expansion) Projects.

8.2 Geology and Soils

As Project impacts on geology and soils would be highly localized and limited primarily to the Project footprints during the periods of active construction, cumulative impacts on geology and soils would only occur if other geographically overlapping projects were constructed at the same time (and place) as the Project (and the exposure of soils to erosion and sedimentation) occurs. Only one of the other projects/actions occurring within the temporal scope of the Project would occur within the geographic scope for the Project (the MVP Project). In the event ground disturbing activities for MVP and Transco’s Project occur at the same time, there would be a minor cumulative increase in the potential for soil erosion from stormwater, high winds, or other soil impacts; however, based on the anticipated schedules as of the issuance of this EA, these two projects are expected to be constructed consecutively, not concurrently. Furthermore, Transco would implement its Plan and Procedures and Project-specific E&SC Plan to minimize impacts on soils. We find that the limited footprint and the measures Transco would adopt to minimize impacts on soils at Station 165 would prevent any significant cumulative impacts on geology and soils from the Project in consideration with MVP.

8.3 Groundwater Resources

Nearby projects that could contribute to cumulative impacts on groundwater resources include the Route 15/17/29 Warrenton Interchange, Fauquier County Central Complex, Prince William County Vint Hill Road Extension, Dominion New Line 2174, MVP, U.S. Route 29 South over Norfolk Southern Railroad, MVP Southgate, and Transco Virginia Southside Expansion Projects.

Construction of the Project could result in minor, temporary impacts on groundwater infiltration due to tree, herbaceous vegetation, or scrub-shrub vegetation clearing. If temporary impacts occur, it would likely be limited to short-term turbidity visible in groundwater or reduced infiltration. We also anticipate that Transco’s SPCC Plan would prevent or minimize the opportunity for and necessitate immediate control and clean-up of spills of fuels, lubricants, or other hazardous material, and would therefore minimize the opportunity for cumulative impacts that could result if other projects were to also result in spills. For these reasons, we conclude that any cumulative impact on groundwater from the Project would be negligible.

8.4 Surface Water Resources and Wetlands

Construction and operation of the Project would mainly result in only short-term impacts on surface water resources (see section B.3.2). These impacts, such as increased turbidity, would return to baseline levels over a period of days or weeks following construction. Longer-term impacts could also occur until adjacent disturbed areas are stabilized through revegetation. Transco would minimize these effects by implementing specific waterbody construction and mitigation measures, including temporary and permanent erosion controls contained in Transco's Plan and Procedures, the Project-specific E&SC Plan, and SPCC, and by complying with applicable federal and state permits requirements.

Nearby projects that could contribute to cumulative impacts on surface water resources include the Route 15/17/29 Warrenton Interchange, Fauquier County Central Complex, Vint Hill Road Extension, New Line 2174, MVP, U.S. Route 29 South over Norfolk Southern Railroad, MVP Southgate, and Virginia Southside Expansion Projects. These projects would individually result in temporary impacts on surface water mostly through the linear construction activities across streams and temporary erosion and sedimentation of exposed soils. For these reasons, we anticipate that the Southeastern Trail Project, when combined with these other projects, would only have a minor and temporary contribution to cumulative impact on surface waters. All FERC-regulated natural gas projects are held to similar robust standards for construction across waterbodies; erosion control; and measures for avoiding, containing, and clean-up of hazardous materials. Non-FERC-regulated projects also would be expected to conform with state and local National Pollutant Discharge Elimination System requirements, at a minimum.

Impact on wetlands resulting from construction of the Southeastern Trail Project would be generally localized and short-term (see discussion in section B.3.3). Nearby projects that could contribute to cumulative impacts on wetlands include the Route 15/17/29 Warrenton Interchange, Fauquier Central Complex, Vint Hill Road Extension, New Line 2174, MVP, U.S. Route 29 South over Norfolk Southern Railroad, MVP Southgate, and Virginia Southside Expansion Projects. These projects could be required, by the terms and conditions of their respective Clean Water Act Section 404 authorization and state permits, to provide compensatory mitigation for unavoidable wetland impacts. Assumingly, these other projects would take steps to avoid and minimize wetland impacts through implementing a wetland construction plan, mitigation measures, and BMPs, potentially resulting in only minor impacts on wetlands.

Of the 2.0 acres of wetlands affected by construction of the Southeastern Trail Project, 1.0 acre are PEM wetlands and 1.0 are PFO wetlands. After construction is completed, PEM wetlands, would revert back to, and maintained, as herbaceous communities. Because Transco would implement FERC's Plan and Procedures and its E&SC, we expect that PEM wetlands would revert to pre-construction conditions within one or two years. For PFO wetlands, there would be a permanent conversion of 1.0 acre to PEM wetlands. Transco would provide mitigation for the permanent conversion of wetland vegetation cover, which would be determined through consultation with the USACE. We conclude that the impact on wetlands from the Project would only have minor contribution to overall minor and temporary cumulative impacts on wetlands when combined with the other projects.

8.5 Vegetation, Wildlife, Fisheries, and Special Status Species

The 9 projects that could potentially contribute to a cumulative impact on vegetation, wildlife, fisheries, and special status species include the Route 15/17/29 Warrenton Interchange, Fauquier Central Complex, Vint Hill Road Extension, New Line 2174, MVP, U.S. Route 29 South over Norfolk Southern Railroad, MVP Southgate, and Virginia Southside Expansion Projects.

Construction of the Manassas Loop and Station 165 would include temporary and permanent impacts on forest, upland, and wetland vegetation types. Given the Manassas Loop would be co-located with existing right-of-way corridors for the majority of the route, the amount of land to be cleared and impacts on vegetation would be minimized. Construction of the Manassas Loop would expand the existing right-of-way rather than create entirely new right-of-way. Other vegetation types would be reduced, but not eliminated from the area. Project activities at Station 165 would occur immediately adjacent to the existing Station 165 facility, which would expand the facility site rather than creating an entirely new facility site. New Line 2174 was constructed in 2017 and 2018, U.S. Route 29 South was completed in 2017, and Virginia Southside Expansion is in-service. However Route 15/17/29 Interchange, Fauquier Central Complex, Vint Hill Road Expansion, MVP, and MVP Southgate Projects are not complete. The types of vegetation that have been or will be impacted by these projects varies from existing right-of-way, agricultural land, forest, scrub-shrub, upland herbaceous, wetland, and open land. However, these projects would have similar requirements, including following the FERC Plan and Procedures in the cases of MVP, MVP Southgate, and Virginia Southside Expansion. All of the projects would be required to follow state, local, and federal permits as well, which include but are not limited to Erosion and Sediment Control Plans and Storm Water Pollution Prevention Plans required by local jurisdictions. Based on the restoration and mitigation efforts to be implemented for the Project, and based on the short duration of Project construction, we find that the Project would not contribute significantly to cumulative impacts on vegetation in the region.

Construction activities would also have minor short-term and long-term impacts on wildlife habitat, resulting in localized impacts on wildlife populations. During construction, clearing and grading along the Manassas Loop and at Station 165 would result in a loss of vegetative cover and may result in mortality to less mobile wildlife species. Following completion of construction of the Project facilities, the temporary construction right-of-way and ATWS would be restored as close as possible to pre-construction conditions. The impacts on wildlife from the seven projects noted above would be similar to impacts from the Project. Other than MVP and Virginia Southside Expansion, the other five projects would occur in previously disturbed areas including existing rights-of-way, agricultural land, or include the replacement of an existing bridge. However, only 20 miles of MVP occur in the geographic scope of the Project, and Virginia Southside Expansion has been in-service since 2015. Given the temporal difference and minimal geographic overlap, the contribution of the projects within the geographic scope would not cause a significant impact on wildlife. Because Project activities are anticipated to have minor or insignificant impacts, cumulative impacts resulting from the Project also would be minor or insignificant, and the Project would not have significant incremental contributions to cumulative impacts on wildlife populations relative to other past, present, or reasonably foreseeable projects in the area.

As stated above, nearby projects that could contribute to cumulative impacts on surface water and fisheries resources include the Route 15/17/29 Warrenton Interchange, Fauquier County Central Complex, Vint Hill Road Extension, New Line 2174, MVP, the U.S. Route 29 South over Norfolk Southern Railroad, MVP Southgate, and the Virginia Southside Expansion. These projects would individually result in temporary impacts on fisheries mostly through the linear construction activities across streams and temporary erosion and sedimentation of exposed soils. For most waterbodies crossed by the Manassas Loop, there would be minimal or no effect to fisheries. Waterbody crossings would be performed in accordance with Transco's Procedures and would reduce effects to aquatic habitat to the extent practicable. Because project activities are anticipated to have minor or insignificant impacts, that part of the cumulative impacts resulting from the Project also will be minor or insignificant, and the Project would not cause significant incremental contributions to cumulative impacts on fishery resources relative to other past, present, or reasonably foreseeable projects in the area. No EFH or tidal wetlands occur within the vicinity of the Project facilities.

Cumulative impacts on protected species can occur when multiple projects impact known or potential habitat for state- and federal-listed RTE species. The VDGIF and FWS have determined that no additional mitigation measures are required for special status species. Transco would adhere to the minimization measures requested and required by the FWS and VGDIF and Project activities are anticipated to have minor or insignificant impacts on special status species. Project impacts on listed species as a result of the seven projects noted as occurring in the appropriate geographic scope above include potential impacts on NLEB, Roanoke logperch, and harperella. These impacts would be minimized in consultation with the FWS and the VDGIF. Based on the adherence to minimization measures such as one time relocations for mussels and tree clearing timing restrictions, no significant incremental contributions to cumulative impacts on RTE species would be associated with the Project relative to other past, present, or reasonably foreseeable projects in the area.

8.6 Land Use

Construction and operation of the new aboveground facilities associated with the Project as well as those associated with The New Line 2174 Project, MVP, MVP Southgate, and Virginia Southside Expansion Project would result in the conversion of existing land uses to industrial/developed land. The conversion of land to industrial/developed land due to the construction and operation of the projects would result in a cumulative impact on land use. However, this impact would be minor as the project areas are predominately surrounded by other industrial/developed areas. Therefore, we conclude that the impacts from this Project when considered cumulatively with past, present, and reasonably foreseeable projects would not contribute to significant cumulative impacts on land use.

Construction and operation of the new aboveground facilities associated with the Project as well as those associated with the New Line 2174, MVP, MVP Southgate, and Virginia Southside Expansion Projects described in table 4 of appendix C would result in changes to existing viewsheds within the project areas. The Project's impacts on visual resources would be greatest near the new aboveground facilities at Compressor Station 165 and 175. Facilities at these locations would be situated adjacent to existing industrial facilities, as previously described, and would be screened by trees. Visual impacts associated with the Manassas Loop would be temporary in nature and limited to the construction phase as it would be located within a previously cleared right-of-way and facility. The overall cumulative impact on visual resources associated with the construction and operation of the projects would be minor due to the existing industrial nature of the areas surrounding each of the projects. Therefore, we conclude that the impacts from this Project when considered cumulatively with past, present, and reasonably foreseeable projects would not contribute to significant cumulative impacts on visual resources.

No public, recreation, or other designated special use areas are crossed by the Project. In addition, no designated visually sensitive areas were identified in the vicinity of the Project. Therefore, the project would not contribute to overall cumulative impacts on recreational resources or visually sensitive areas within the geographic scope.

8.7 Cultural Resources

Cumulative impacts would occur if the Southeastern Trail Project and another project were to result in overlapping effects on a cultural resource. None of the projects listed above overlap the cumulative impacts geographic scope for cultural resources. Projects defined as federal actions would have to adhere to section 106 of the NHPA and include mitigation measures designed to avoid or minimize additional impacts on cultural resources. Non-federal actions would need to comply with mitigation measures required by the affected states. Because Transco would be required to implement

treatment measures if historic properties would be adversely affected, impacts on cultural resource would be minimized and would not contribute to significant cumulative impacts on cultural resources.

8.8 Air Quality and Noise

With the exception of the GHG emissions, air impacts would be localized and confined primarily to the airshed in which the Project occurs. Furthermore, although the Project is expected to slightly increase GHG emissions, the Project would not have a discernible influence on regional climate change. The combined effect of multiple construction projects occurring in the same airshed and timeframe could temporarily add to the ongoing air quality effects of existing activities. Typically, smaller local projects have varying construction schedules and would take place over a relatively large geographic area. We conclude that the Project would not have a significant long-term adverse impact on air quality and would not add significantly to the long term cumulative impact of the area.

The Project could contribute to cumulative noise impacts. However, the impact of noise is highly localized and attenuates quickly as the distance from the noise source increases. Therefore, cumulative impacts are unlikely unless one or more of the local projects is constructed at the same time in the same location. Therefore, we conclude that cumulative noise impacts would not be significant.

Based on our analysis, the Project would contribute no significant cumulative impact when combined with other past, present, and reasonably foreseeable project in the vicinity. Therefore, we conclude air quality and noise impacts would have a significant cumulative impact to the region.

8.9 Conclusion on Cumulative Impacts

We identified recently completed, ongoing, and planned projects in the proposed Project area that met the criteria for inclusion in the cumulative impacts study in table 4 in appendix C. We identified other projects within appropriate geographic scopes, including the Route 15/17/29 Warrenton Interchange, Fauquier Central Complex, Cunningham Farm and Carter's Crossing, New Lines 2086 and 2155, I-66 and Route 15 Interchange Reconstruction, Vint Hill Road Extension, New Line 2174, Farm Heritage Museum, Route 53 and Route 618, MVP, U.S. Route 29 South over Norfolk Southern Railroad, and Virginia Southside Expansion.

Based on the co-location of the Project pipeline with existing rights-of-way, Transco's implementation of impact avoidance, minimization, and mitigation measures as described in its construction and restoration plans, and adherence to our recommendations, we find that most of the Project impacts would be largely limited to the 7.7-mile-long corridor followed by the pipeline.¹⁰ Furthermore, we find that the impacts of the Project discussed above would generally be localized and minimal. Therefore, we conclude that Project would not result in significant cumulative impacts on the resources described above.

9.0 ALTERNATIVES

As required by NEPA and Commission policy, we identified and evaluated alternatives to the specific natural gas transmission facilities (and locations) comprising the Project as proposed by the applicant in their application and associated supplements. Specifically, we evaluated the no action alternative, system alternatives, and route and facility alternatives (including aboveground facility

¹⁰ Please note this narrow corridor is not the expanded area of our cumulative impacts review, it is only the area directly affected by the Project.

alternatives and pipeline route alternatives). The only viable alternatives to mainline facility station reversals and deodorization modifications would include the construction of new compressor stations, which would result in significant environmental and cost impacts. Therefore, these options were not considered further. No viable options exist for mainline valve deodorization modifications.

The purpose of this evaluation is to determine whether an alternative would be preferable to the proposed action. We generally consider an alternative to be preferable to a proposed action using three evaluation criteria, as discussed in greater detail below. These criteria include the alternative meets the stated purpose of the Project, it is technically and economically feasible and practical, and it offers a significant environmental advantage over a proposed action.

Our evaluation of the identified alternatives is based on Project-specific information provided by the applicant, affected landowners, and other concerned parties; publicly available information; our consultations with federal and state resource agencies; and our expertise and experience regarding the siting, construction, and operation of natural gas transmission facilities and their potential impact on the environment. In evaluating alternatives, we considered and addressed, as appropriate, the comments provided to the Commission about possible alternatives.

As described in section A.5, the Commission received several comments expressing concern about the Project. The comments primarily concerned the FERC process, sensitive habitats and species, land use, noise, and safety. Comments received during the scoping period are addressed in the applicable sections of the EA. None of the environmental comments received suggested that we evaluate specific alternatives.

9.1 Evaluation Process

Through environmental comparison and application of our professional judgement, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g., publicly available data, GIS data, aerial imagery) and assume the same right-of-way widths and general workspace requirements. Where appropriate, we also use site-specific information (e.g., field surveys or detailed designs). As described previously, our environmental analysis and this evaluation only considers quantitative data (e.g., acreage or mileage) and uses common comparative factors such as total length, amount of collocation, and land requirements. Our evaluation also considers impacts on both the natural and human environments. Impacts on the natural environment include wetlands, forested lands, geology, and other common environmental resources. Impacts on the human environment include residences, roads, utilities, and industrial and commercial development near construction workspaces. In recognition of the competing interests and the different nature of impacts resulting from an alternative that sometimes exist (i.e., impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative or discount or eliminate factors that are not relevant or may have less weight or significance.

The purpose of the Project, which is described in greater detail in section A.2, is to provide 296,375 dekatherms per day of additional firm transportation capacity from the Pleasant Valley Interconnect facility (Dominion Energy Cove Point Pipeline) in Fairfax County, Virginia to the existing Station 65 pooling point located in St. Helena Parish, Louisiana. Therefore, a preferable alternative must create similar transportation capabilities as those of the proposed action. An alternative that would significantly reduce or eliminate the price competitiveness of the transported natural gas would not satisfy the purpose for the Project and is not a preferable alternative to the proposed action.

Many alternatives are technically and economically feasible. Technically practical alternatives, with exceptions, would generally require the use of common construction methods. An alternative that would require the use of a new, unique, or experimental construction method may not be technically practical because the required technology is not available or is unproven. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render the Project economically impractical.

Determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources (factors), we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

One of the goals of an alternatives analysis is to identify alternatives that avoid significant impacts. In section B, we evaluated each environmental resource potentially affected by the Project and concluded that constructing and operating the Project would not significantly impact these resources. Consistent with our conclusions, the value gained by further reducing the (not significant) impacts of the Project when considered against the cost of relocating the route/facility to a new set of landowners was also factored into our evaluation.

9.2 No-Action Alternatives

Under the No-Action Alternative, Transco would not implement the proposed action. The No-Action Alternative would avoid the potential environmental impacts associated with construction of the Project; however, the Project's objective would not be met, of Transco to provide firm transportation capacity from an interconnect in Virginia to a pooling point in Louisiana.

Other natural gas transmission companies would be required to increase their capacity and construct new facilities to meet the known demand for transportation capacity. Such actions would likely transfer impacts from one location to another, but would not eliminate or necessarily reduce impacts and may have larger environmental impacts than the Project. The No-Action Alternative would result in a lost or delayed opportunity to provide firm transportation capacity from an interconnect in Virginia to a pooling point in Louisiana with limited environmental impact.

9.3 System Alternatives

System alternatives are alternatives to the proposed actions that would meet the Project objectives, but would use existing or modified pipeline systems or a different configuration of pipeline facilities that would render all or part of the proposed facilities unnecessary.

We evaluated technically feasible system alternatives in terms of their ability to meet the Project objectives, namely to provide firm transportation capacity for 296,375 dekatherms per day of firm transportation capacity from the Pleasant Valley Interconnect facility in Fairfax County, Virginia to Station 65 in St. Helena Parish, Louisiana. Two options on Transco's system were considered: new pipeline looping and new compression.

Compressor-Intensive Alternative

We evaluated the Compressor-Intensive Alternative to avoid impacts associated with ground disturbances along the proposed pipe looping. This alternative would involve the installation of additional compression at the existing Stations 185, 175 and 165 without incremental pipeline looping. The Compressor-Intensive Alternative would require the installation/up-rating of compressor units totaling 91,635 ISO HP or 10,915 ISO HP more than the 80,720 ISO HP required by the proposed Project. The 91,635 ISO HP comprising the Compressor-Intensive Alternative would include the same compression additions at locations where compression is proposed to be added or modified as a part of the Project (Station 185, Station 175, and Station 165). In addition, a 10,915 ISO HP compressor addition would be required at Station 180. The Compressor-Intensive Alternative would result in greater fuel consumption, fuel costs, and air emissions, while overall land disturbance during construction would be less than the proposed Project.

In terms of emissions, federal and state regulations for large HP projects require broad evaluation of air impacts, as well as installation of stringent emission controls, thus the Compressor-Intensive Alternative would increase permitting complexity. Moreover, Transco estimates a 5.3 pound per hour (lb/hr) increase in the NO_x emission rate based on typical emissions from the addition of 10,915 ISO HP of natural gas-fired compression (e.g., Solar T70) that would be required at Station 180. Annual emissions for the addition of natural gas fired compression at Station 180 would result in the following increases relative to the proposed Project's emissions:

- NO_x: 23.3 Tons per year (TPY)
- CO: 23.6 TPY
- VOC: 2.7 TPY
- SO₂: 1.4 TPY
- PM/PM_{2.5}: 2.8 TPY
- CO_{2e}: 50,000 TPY

One-time emissions associated with constructing new compression at Station 180 as part of Compressor-Intensive Alternative are similar to the construction emissions associated with Project, therefore there is no material benefit for the Compressor-Intensive Alternative versus the Project related to construction emissions.

For the above reasons, we did not find the Compression-Intensive Alternative to offer a significant environmental advantage over the proposed Project and it was, therefore, eliminated from further consideration.

Loop-Intensive Alternative

We reviewed the Loop-Intensive Alternative in order to minimize potential impacts associated with increased compressor emissions associated with the proposed Project. This alternative would emphasize the use of pipeline loops to be installed along the Transco Mainline to provide the Project capacity. The Loop-Intensive Alternative would require a total of 48.4 miles of new pipeline loop, compared to 7.7 miles required in the proposed Project. The distance between beginning and ending mileposts may not reflect the actual length of each loop, as the length of each loop is based on the distance between mileposts along existing pipelines. Thus, crossover or variations of the pipeline loops would lengthen the mileage when compared to the existing pipelines and mileposts. The Loop-Intensive Alternative would include a lengthened Manassas Loop, plus two additional loops, totaling an increase of 40.7 miles of pipeline as listed below:

- 12.2 miles total pipeline length of 42-inch-diameter loop from MP 1568.16 to MP 1580.17 in Fauquier and Prince William Counties, Virginia;
- 17.8 miles total pipeline length of 42-inch-diameter loop from MP 1499.36 to MP 1517.06 in Fluvanna and Louisa Counties, Virginia; and
- 18.4 miles total pipeline length of 42-inch-diameter loop from MP 1412.99 to MP 1431.37 in Pittsylvania and Campbell Counties, Virginia.

Transco states that the Loop-Intensive Alternative would be marginally greater in reliability compared to the proposed Project due to the greater reliability of the pipeline loops versus compression additions. However, the increase in over 40 miles of temporary and permanent construction impacts across all resource areas associated with the Loop-Intensive Alternative could result in a significant increase in impacts when compared to the proposed Project. In addition, the Loop-Intensive Alternative is estimated to cost approximately 60 percent more than the Project, which may be economically infeasible for the customers.

For the above reasons, we did not find the Loop-Intensive Alternative to offer a significant environmental advantage over the proposed Project and it was, therefore, eliminated from further consideration.

9.4 Route and Facility Alternatives

In this section we evaluate a route alternative for the Manassas Loop and facility modifications to the proposals at the existing stations. Route alternatives represent deviations from a proposed route that may offer a significant environmental advantage compared to the proposed route. The facility modifications we reviewed entailed varying the type of compressor units.

Manassas Loop Route Alternatives

In order to minimize potential impacts associated with the proposed crossing of Broad Run, we considered a route alternative to the Manassas Loop that would originate at the existing MLV 180-20 site in Fauquier County, Virginia and extend along the existing Transco Mainline from milepost 1573.0 to milepost 1580.1 in Prince William County, Virginia. This route alternative would include three horizontal directional drill crossings of Broad Run, a VDGIF threatened and endangered species water, in order to minimize direct disturbances to the waterbody. However, the northern 2.1 miles of this alternative would extend through residential areas, significantly increasing residential impacts. We concluded that this alternative would not offer a significant environmental advantage over the proposed Project because of the horizontal directional drill crossings, which require a significant amount of workspace on either end, and because the route would impact a greater number of residential landowners.

We received a comment requesting an analysis of placing the Manassas Loop in the footprint of three existing pipelines, rather than creating new right-of-way. Transco states in its response dated February 4, 2019 that it considered this alternative, but it is not possible to maintain enough separation between existing pipelines and existing third party owned fiber optic lines. Transco states that 25 feet of separation between large-diameter, high-pressure natural gas transmission pipelines is needed in order to provide clear access to safely excavate, construct, and perform future maintenance. Twenty-five feet of separation would also allow construction to take place without regularly operating heavy equipment over the existing, in-service pipelines. Furthermore, although Transco's existing Mainlines A and B are separated by approximately 50 feet, this space is occupied by an existing fiber optic line owned by a third party. Based on this information and that Transco would co-locate the pipeline adjacent to existing

rights-of-way for 97 percent of the route, we find that this alternative is not technically practical and is therefore not considered further.

Station 175 Alternatives

To minimize associated air emissions, we evaluated an alternative to the Project activities at Station 175 to install a new electric motor driven centrifugal compressor instead of the proposed turbine-driven compressor unit. In evaluating the addition of a centrifugal compressor driven by a 30,000 HP electric motor, Transco contacted the electric utility provider, Central Virginia Electric Cooperative (CVEC), to determine if the existing infrastructure could support the additional load at the site. CVEC indicated that a system study was required, and the additional load would likely require a system upgrade to support the expansion. Because the time required to implement the CVEC system upgrade did not meet the Project timeline, this option was eliminated from consideration.

Station 165 Alternatives

To minimize associated air emissions, we evaluated an alternative to the Project activities at Station 165 to install a new electric motor driven centrifugal compressor instead of the two proposed turbine-driven compressor units. In evaluating the addition of a centrifugal compressor driven by a 30,000 HP electric motor, Transco contacted the electric utility provider, Mecklenburg Co-Op, to determine if the existing infrastructure could support the additional load at the site. Mecklenburg Co-Op indicated that the current 69-kilovolt line would need to be upgraded to a 138-kilovolt line and that an engineering analysis would need to be performed to add the upgrade to the Mecklenburg Co-Op project list. Because the time required to implement the Mecklenburg Co-Op upgrade did not meet the Project timeline, this option was eliminated from consideration.

9.5 Conclusions

We reviewed alternatives to Transco's proposed Project based on our independent analysis. Although all of the system alternatives and route and facility alternatives we evaluated appear to be technically feasible, none provide a significant environmental advantage over the Project design. Therefore, we conclude that the proposed Project, as modified by our recommendations in section C of this EA, is the preferred alternative to meet Project objectives.

C. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Transco constructs, abandons, and operates the proposed facilities in accordance with its application and supplements, and the staff's recommended mitigation measures, approval of this proposal would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Order contain a finding of no significant impact and include the mitigation measures listed below as conditions to any Certificate and authorization the Commission may issue.

1. Transco shall follow the construction and abandonment procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Transco must:
 - a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
 - b. justify each modification relative to site-specific conditions;
 - c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
 - d. receive approval in writing from the Director of the OEP **before using that modification**.
2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of environmental resources during construction and operation of the Project, and abandonment activities. This authority shall allow:
 - a. the modification of conditions of the Order;
 - b. stop-work authority; and
 - c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project construction and operation.
3. **Prior to any construction**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.
4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Transco shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

Transco's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Transco's right of eminent domain granted under NGA section 7(h) does not

authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Transco shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area.**

This requirement does not apply to extra workspace allowed by the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan* and/or minor field realignments per landowner needs and requirements which do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

- a. implementation of cultural resources mitigation measures;
 - b. implementation of endangered, threatened, or special concern species mitigation measures;
 - c. recommendations by state regulatory authorities; and
 - d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.
6. **At least 60 days before construction or abandonment begins**, Transco shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Transco must file revisions to the plan as schedules change. The plan shall identify:
 - a. how Transco will implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
 - b. how Transco will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to on-site construction and inspection personnel;
 - c. the number of EIs assigned (per spread), and how Transco will ensure that sufficient personnel are available to implement the environmental mitigation;
 - d. Transco personnel, including EIs and contractors, who will receive copies of the appropriate material;
 - e. the location and dates of the environmental compliance training and instructions Transco will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change);
 - f. Transco personnel (if known) and specific portion of Transco's organization having responsibility for compliance;

- g. the procedures (including use of contract penalties) Transco will follow if noncompliance occurs; and
 - h. for each discrete facility, a Gantt or Program Evaluation Review Technique chart (or similar project scheduling diagram), and dates for:
 - (1) the completion of all required surveys and reports;
 - (2) the environmental compliance training of on-site personnel;
 - (3) the start of construction; and
 - (4) the start and completion of restoration.
7. Transco shall employ at least one EI for the Project facilities in Virginia and one EI for the remaining facility sites. The EI shall be:
- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
 - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
 - c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
 - d. specific to the Virginia facilities, a full-time position, separate from all other activity inspectors;
 - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports.
8. Beginning with the filing of its Implementation Plan, Transco shall file updated status reports with the Secretary on a **biweekly basis until all construction, abandonment, and restoration activities are complete**. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:
- a. an update on Transco's efforts to obtain the necessary federal authorizations;
 - b. the construction status of each spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;
 - c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
 - d. a description of the corrective actions implemented in response to all instances of noncompliance;
 - e. the effectiveness of all corrective actions implemented;
 - f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
 - g. copies of any correspondence received by Transco from other federal, state, or local permitting agencies concerning instances of noncompliance, and Transco's response.

9. Transco must receive written authorization from the Director of OEP **before commencing construction of any Project facilities**. To obtain such authorization, Transco must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).
10. Transco must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.
11. **Within 30 days of placing the authorized facilities in service**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official:
 - a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the Certificate conditions Transco has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.
12. **Prior to construction**, Transco shall file with the Secretary, for review and written approval by the Director of OEP, an Unanticipated Discovery of Contamination Plan to respond to potential soil and groundwater contamination encountered during construction of the Project.
13. **Prior to construction**, Transco shall file with the Secretary the following regarding Station 175:
 - a. a current aerial figure that indicates the extent of temporary workspaces, all wetland and waterbody boundaries, and permanent workspaces; and
 - b. Best Management Practices drawings indicating the distance between the wetlands and the temporary workspace and how Transco will protect the wetlands, for review and written approval by the Director of OEP.
14. **Prior to construction**, Transco shall determine disposal methods for vegetative debris that comply with its Plan (section III.E and V.A.6), and file these plans with the Secretary for review and written approval by the Director of OEP.
15. **Prior to construction**, Transco shall file with the Secretary the Nationwide Permit No. 12 for the Project, which serves as documentation that the Project is consistent with the Virginia Coastal Zone Management Program, or a copy of the determination of consistency with the Coastal Zone Management Program issued by the Virginia Department of Environmental Quality.
16. Transco **shall not begin construction** of facilities and use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:
 - a. Transco files with the Secretary;
 - (1) the Virginia SHPO's comments on the "Assessment of Effects", and
 - (2) any required avoidance and/or treatment/mitigation plans, and the Virginia SHPO's comments on the plans;
 - b. the Advisory Council on Historic Preservation is afforded an opportunity to comment if historic properties would be adversely affected; and

- c. the FERC staff reviews and the Director of OEP approves the cultural resources reports and plans, and notifies Transco in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All material filed with the Commission containing **location, character, and ownership information** about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **“CUI//PRIV – DO NOT RELEASE”**.

17. Transco shall file with the Secretary a noise survey for Compressor Station 185 **no later than 60 days** after placing the modified unit in service. If full power load condition noise survey is not possible, Transco shall file an interim survey at the maximum possible power load **within 60 days** of placing the modified unit into service and file the full power load survey **within 6 months**. If the noise attributable to operation of all the equipment at the station under interim or full power load conditions exceeds the previously existing noise levels that are at or above an Ldn of 55 dBA at the nearby noise-sensitive areas, Transco shall:
 - a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;
 - b. implement additional noise control measures to reduce the operating noise level at the noise-sensitive areas to or below the previously existing noise level **within 1 year** of the in-service date; and
 - c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.
18. Transco shall file noise surveys with the Secretary **no later than 60 days** after placing the authorized units at Compressor Station 175 and Compressor Station 165 in service. If a full power load condition noise survey is not possible, Transco shall file an interim survey at the maximum possible power load **within 60 days** of placing the authorized units into service and file the full power load survey **within 6 months**. If the noise attributable to the operation of all equipment at the stations under interim or full power load conditions exceeds an Ldn of 55 dBA at any nearby noise-sensitive areas, Transco shall:
 - a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;
 - b. install additional noise controls to meet that level **within 1 year** of the in-service date; and
 - c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

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FIGURE 1
TYPICAL
CONSTRUCTION
RIGHT-OF-WAY
CROSS SECTION



Transcontinental Gas Pipe Line Company LLC


TYPICAL RIGHT-OF-WAY CROSS-SECTION
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
M.P. 1568.13 TO M.P. 1575.85
FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA

F-MANA-D-XS-01

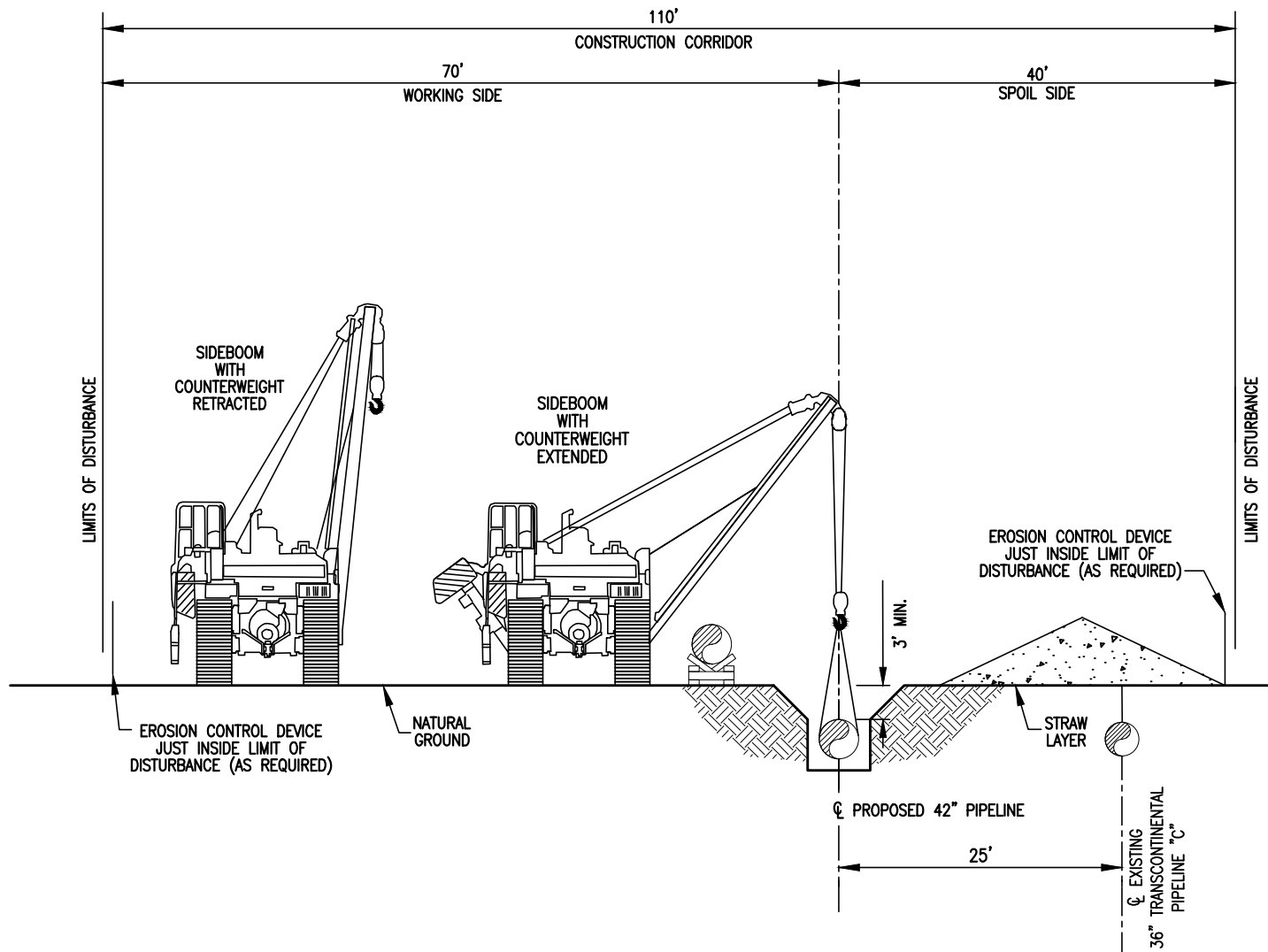
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F-MANA-D-XS-01	01		COVERSHEET	0	04/04/2018
F-MANA-D-XS-01	02		TABLE OF CONTENTS	0	04/04/2018
F-MANA-D-XS-01	03	110	NO TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	0	04/04/2018
F-MANA-D-XS-01	04	125-210	NO TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	0	04/04/2018
F-MANA-D-XS-01	05	130-140	NO TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE	0	04/04/2018
F-MANA-D-XS-01	06	160-220	NO TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	0	04/04/2018
F-MANA-D-XS-01	07	140-170	TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	0	04/04/2018
F-MANA-D-XS-01	08	170-200	TOPSOIL STRIPPING- ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	0	04/04/2018
F-MANA-D-XS-01	09	75-100	WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	0	04/04/2018
F-MANA-D-XS-01	10		CROSS-SECTION TYPICAL MILEPOST LISTING	0	04/04/2018
F-MANA-D-XS-01	11		CROSS-SECTION TYPICAL MILEPOST LISTING	0	04/04/2018
F-MANA-D-XS-01	12		CROSS-SECTION TYPICAL MILEPOST LISTING	0	04/04/2018
F-MANA-D-XS-01	13		CROSS-SECTION TYPICAL MILEPOST LISTING	0	04/04/2018

DRAWING NO.		REFERENCE TITLE				TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA					
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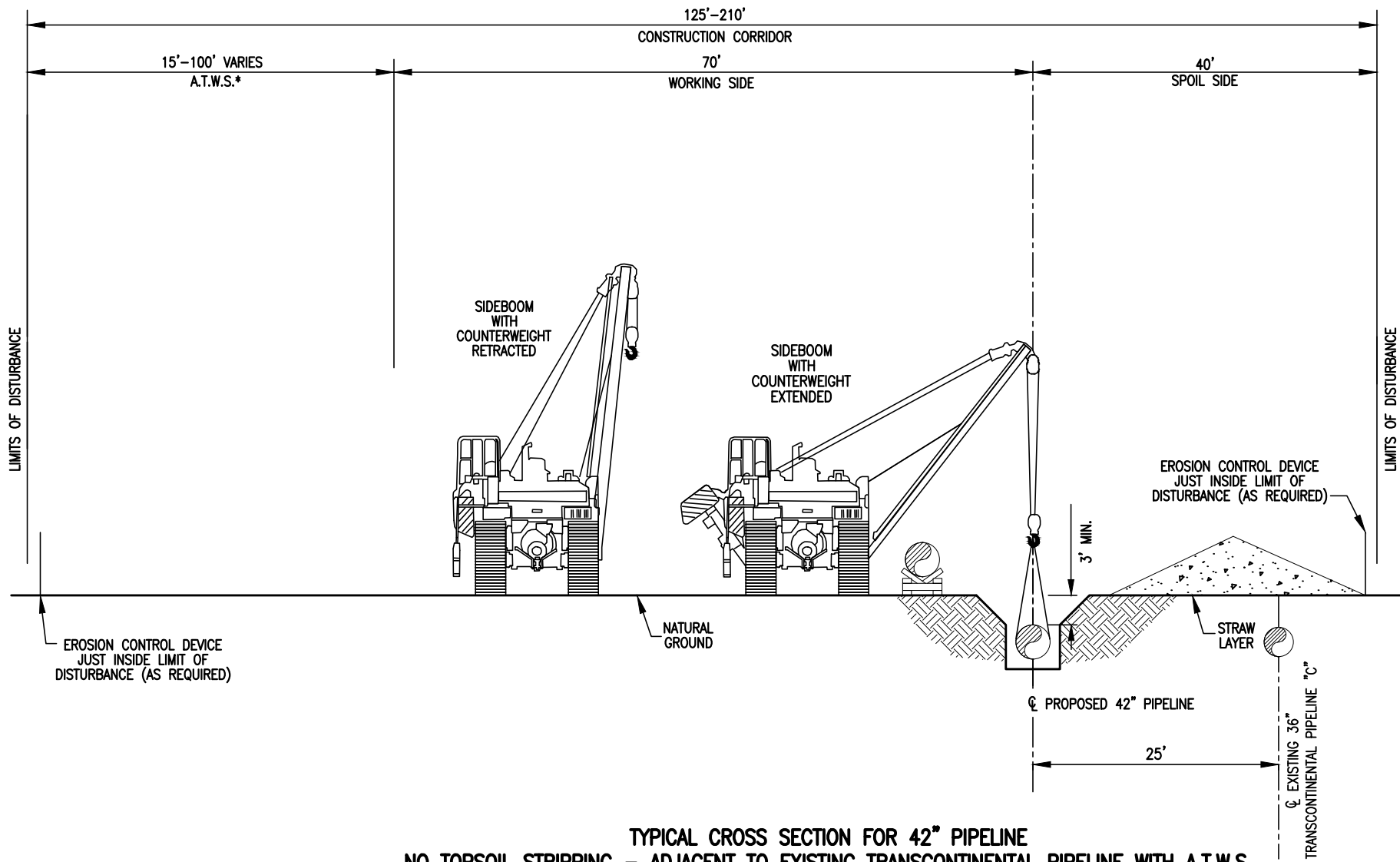




**TYPICAL CROSS SECTION FOR 42" PIPELINE
NO TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE**


DRAWING NO.		REFERENCE TITLE								
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA										
										
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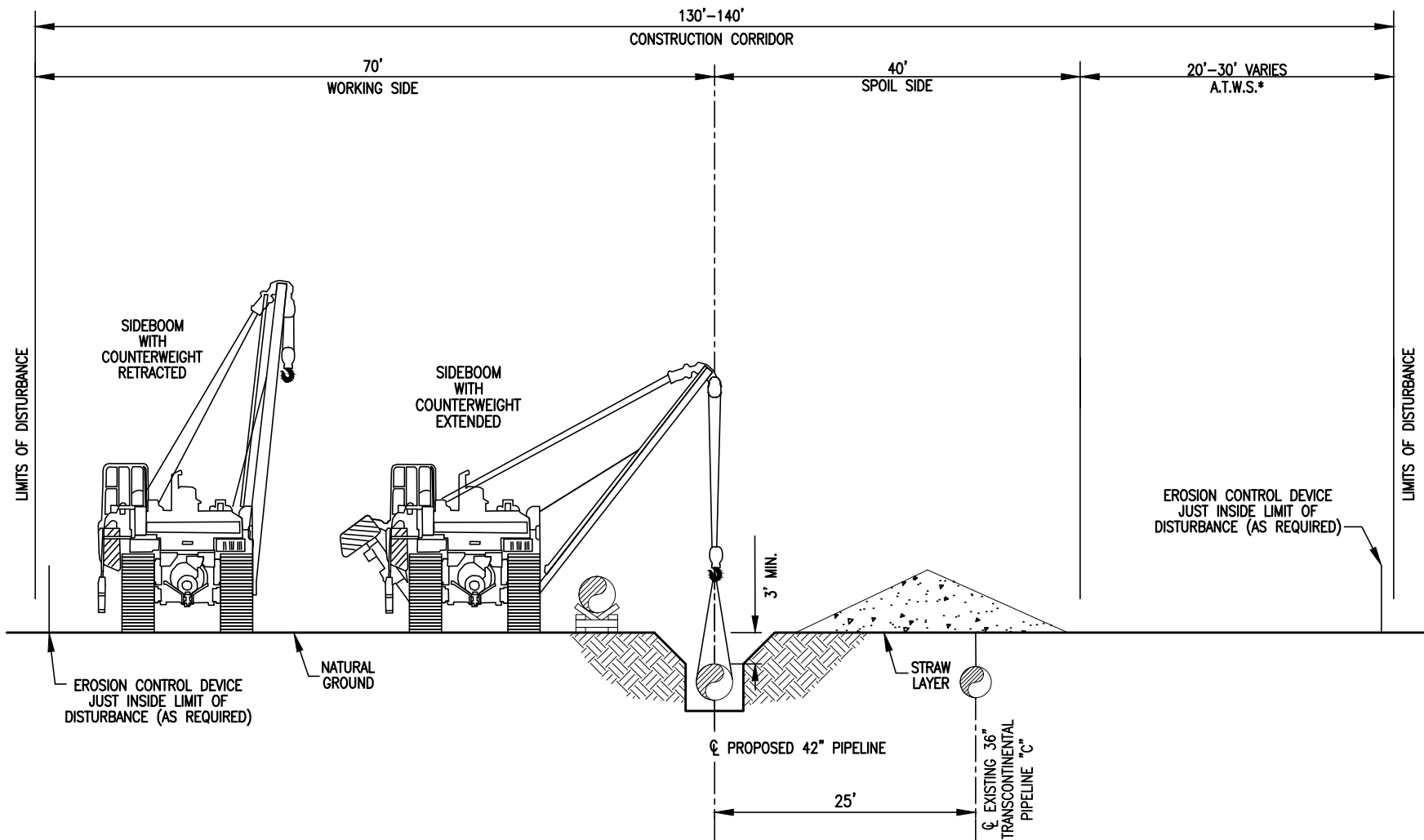


TYPICAL CROSS SECTION FOR 42" PIPELINE
NO TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING AND/OR DRAG SECTION.


DRAWING NO.		REFERENCE TITLE								
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA										
										
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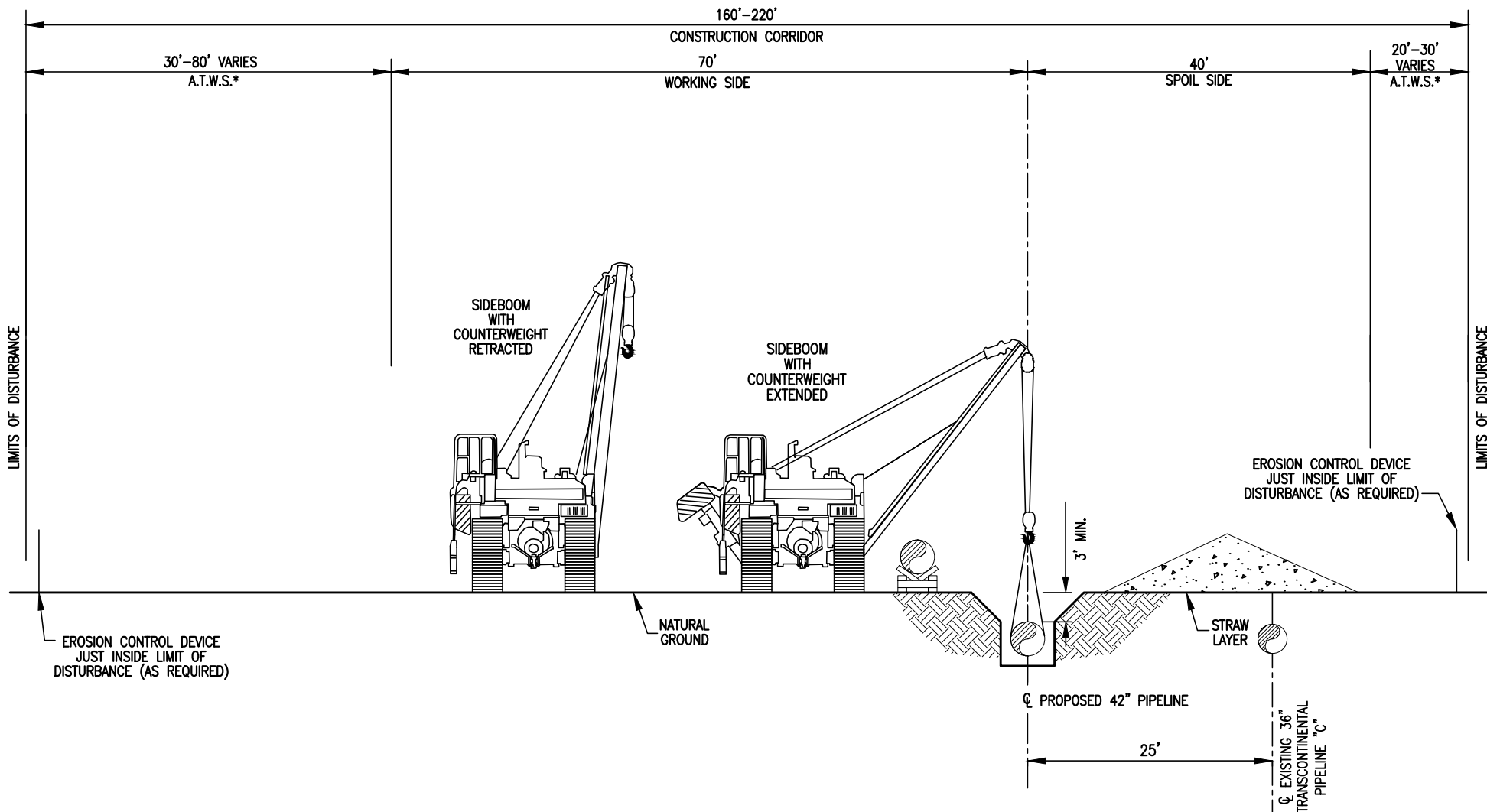


**TYPICAL CROSS SECTION FOR 42" PIPELINE
NO TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE**

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, CROSSOVER, STREAM CROSSING, ROAD CROSSING, WETLAND CROSSING AND/OR DRAG SECTION.


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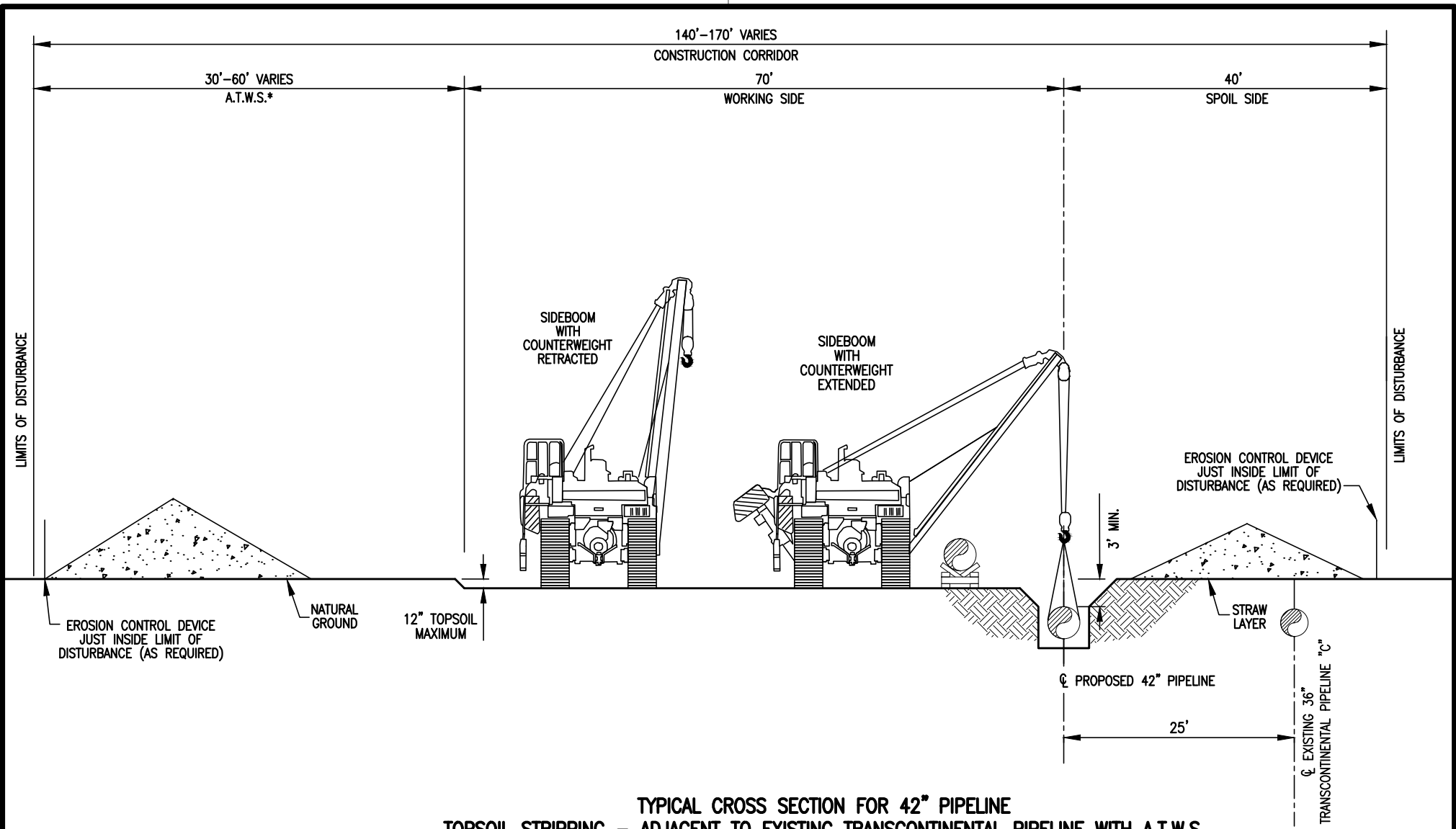


**TYPICAL CROSS SECTION FOR 42" PIPELINE
NO TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES**

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, STREAM CROSSING, ROAD CROSSING AND/OR DRAG SECTION.


DRAWING NO.		REFERENCE TITLE								
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA										
										
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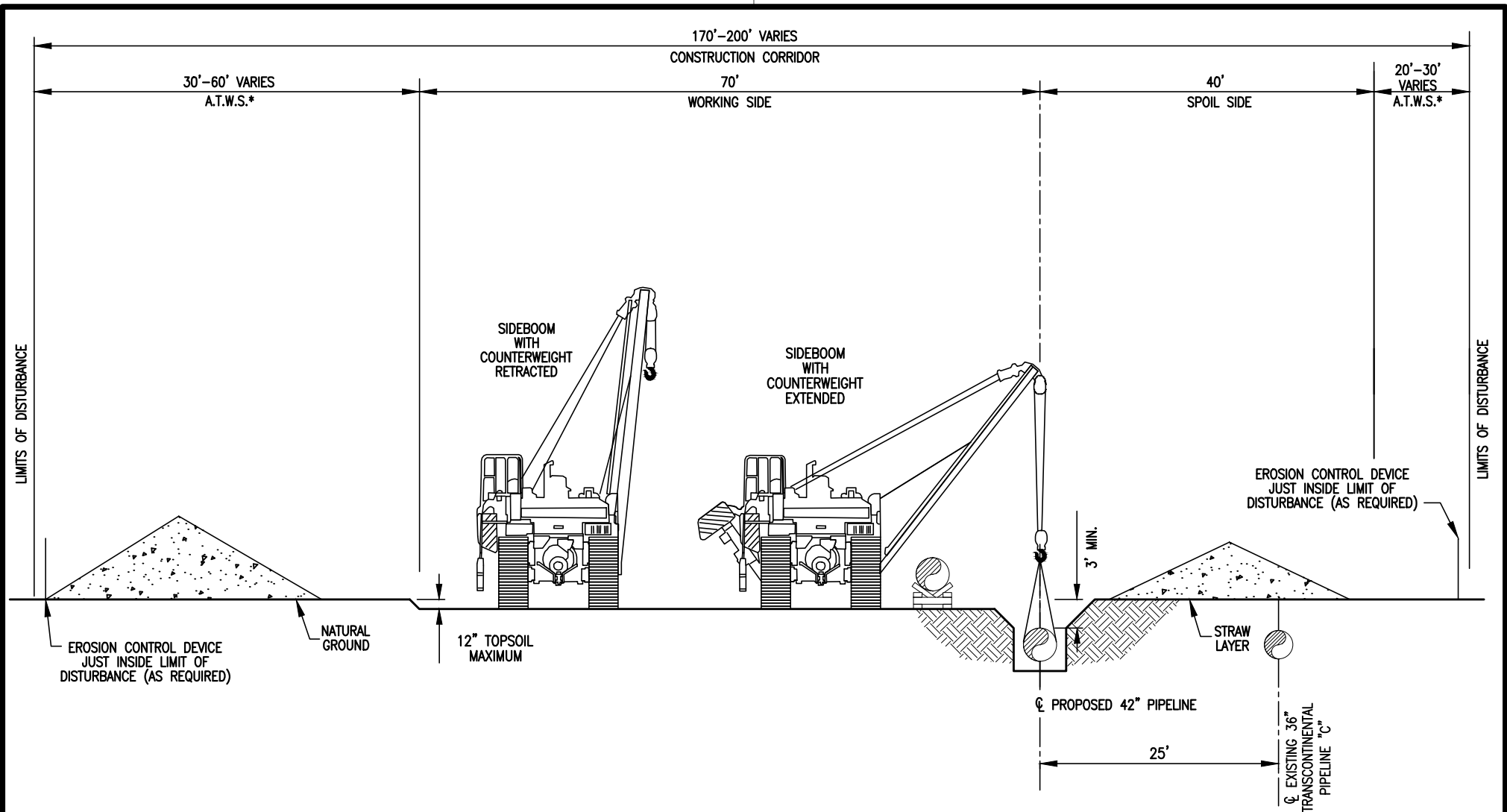


**TYPICAL CROSS SECTION FOR 42" PIPELINE
TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.**

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, STREAM CROSSING, ROAD CROSSING, TOPSOIL SEGREGATION AND/OR DRAG SECTION.


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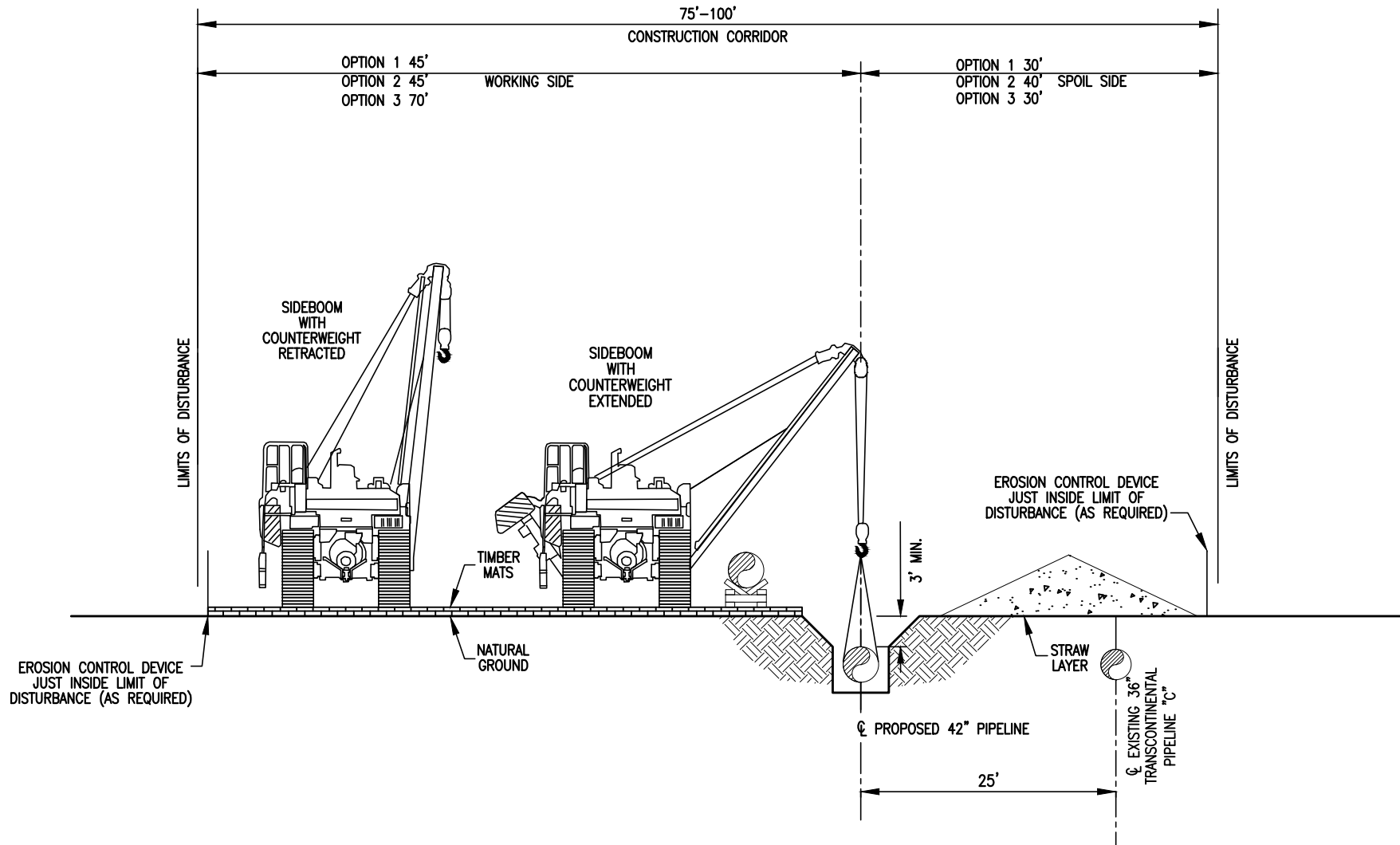


**TYPICAL CROSS SECTION FOR 42" PIPELINE
TOPSOIL STRIPPING – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES**

* A.T.W.S. FOR SPOILS RELATED TO: P.I., SIDE SLOPE, STREAM CROSSING, TOPSOIL SEGREGATION AND/OR DRAG SECTION.

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**TYPICAL CROSS SECTION FOR 42" PIPELINE
WITHIN SATURATED WETLAND AREAS – ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE**

DRAWING NO.		REFERENCE TITLE			TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA						
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NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.16	1568.16
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE	5	1568.16	1568.19
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.19	1568.20
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1568.20	1568.27
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1568.27	1568.28
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	8	1568.28	1568.37
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE	5	1568.37	1568.38
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1568.38	1568.43
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.43	1568.44
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1568.44	1568.61
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.62	1568.66
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1568.70	1568.72
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.72	1568.73
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	6	1568.88	1568.95
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1568.95	1568.98
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1568.98	1569.08
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1569.18	1569.19
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1569.25	1569.28
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1569.32	1569.33
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1569.34	1569.35
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1569.35	1569.69
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1569.69	1569.77
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	6	1569.78	1569.81
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1569.81	1569.82
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE	5	1569.82	1569.84
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	8	1569.84	1569.86
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1569.86	1569.87
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1569.93	1569.96
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1569.96	1569.99
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1569.99	1570.10
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1570.10	1570.14
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1570.14	1570.32

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TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA



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Cross Section Typical Name	Sheet Number	Begin MP	End MP
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.32	1570.34
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1570.37	1570.42
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	6	1570.43	1570.46
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.46	1570.54
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1570.54	1570.59
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.59	1570.66
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1570.66	1570.72
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.72	1570.82
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1570.82	1570.82
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.82	1570.87
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1570.87	1570.98
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1570.98	1571.02
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.02	1571.02
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.08	1571.09
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1571.09	1571.11
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1571.11	1571.30
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.30	1571.30
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1571.30	1571.46
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.46	1571.54
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1571.54	1571.61
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.61	1571.70
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1571.70	1571.77
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.77	1571.80
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1571.80	1571.86
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.86	1571.90
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1571.90	1571.94
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1571.94	1572.03
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1572.03	1572.06
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1572.06	1572.08
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1572.08	1572.16
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1572.16	1572.20
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1572.20	1572.26
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1572.26	1572.28
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1572.28	1572.46

DRAWING NO.		REFERENCE TITLE				TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: FH	DATE: 01/09/18	ISSUED FOR BID:	SCALE: NTS	
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							APPROVED BY: EL	DATE: 01/09/18	DRAWING NUMBER: F-MANA-D-XS-01		SHEET 11
							WO: 1199779	ROUTE I.D. 101-2/26/18	3/27/2018 12:21 pm K:\MAPPING\VA\MAIN\LOOP\1568_17\FERC\FERC\Misc\F-MANA-D-XS-01-MILEPOST TABLE.dwg		OF 13



Cross Section Typical Name	Sheet Number	Begin MP	End MP
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1572.46	1572.48
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1572.48	1572.52
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1572.52	1572.57
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1572.57	1572.64
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1572.64	1572.66
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON SPOIL SIDE	5	1572.66	1572.72
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	8	1572.72	1572.76
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1572.76	1572.95
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1573.08	1573.14
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1573.14	1573.17
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1573.17	1573.34
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1573.34	1573.35
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1573.35	1573.50
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1573.50	1573.51
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1573.51	1573.65
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1573.65	1573.80
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1573.80	1573.83
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1573.86	1573.93
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1573.93	1573.96
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1573.96	1574.01
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.01	1574.19
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1574.19	1574.21
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.21	1574.23
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.23	1574.28
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.28	1574.28
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.28	1574.36
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.43	1574.44
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.44	1574.57
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	8	1574.57	1574.60
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.60	1574.63
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S. ON BOTH SIDES	8	1574.63	1574.64
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.67	1574.69
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.69	1574.70
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.73	1574.77
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1574.77	1574.80

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TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
TYPICAL RIGHT-OF-WAY CROSS-SECTION
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA



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CHECKED BY: W.	DATE: 01/09/18	ISSUED FOR CONSTRUCTION:	REV: 0
APPROVED BY: EL	DATE: 01/09/18	DRAWING NUMBER: F-MANA-D-XS-01	SHEET 12
WO: 1199779	ROUTE I.D. 101-2/26/18	12:23pm 3/27/2018 Dan.Poulson	OF 13



Cross Section Typical Name	Sheet Number	Begin MP	End MP
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.80	1574.82
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1574.86	1574.87
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1574.97	1575.27
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1575.27	1575.40
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1575.40	1575.48
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1575.48	1575.57
WITHIN SATURATED WETLAND AREAS - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	9	1575.57	1575.60
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1575.60	1575.64
TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	7	1575.64	1575.70
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE	3	1575.70	1575.71
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1575.76	1575.79
NO TOPSOIL STRIPPING - ADJACENT TO EXISTING TRANSCONTINENTAL PIPELINE WITH A.T.W.S.	4	1575.80	1575.82


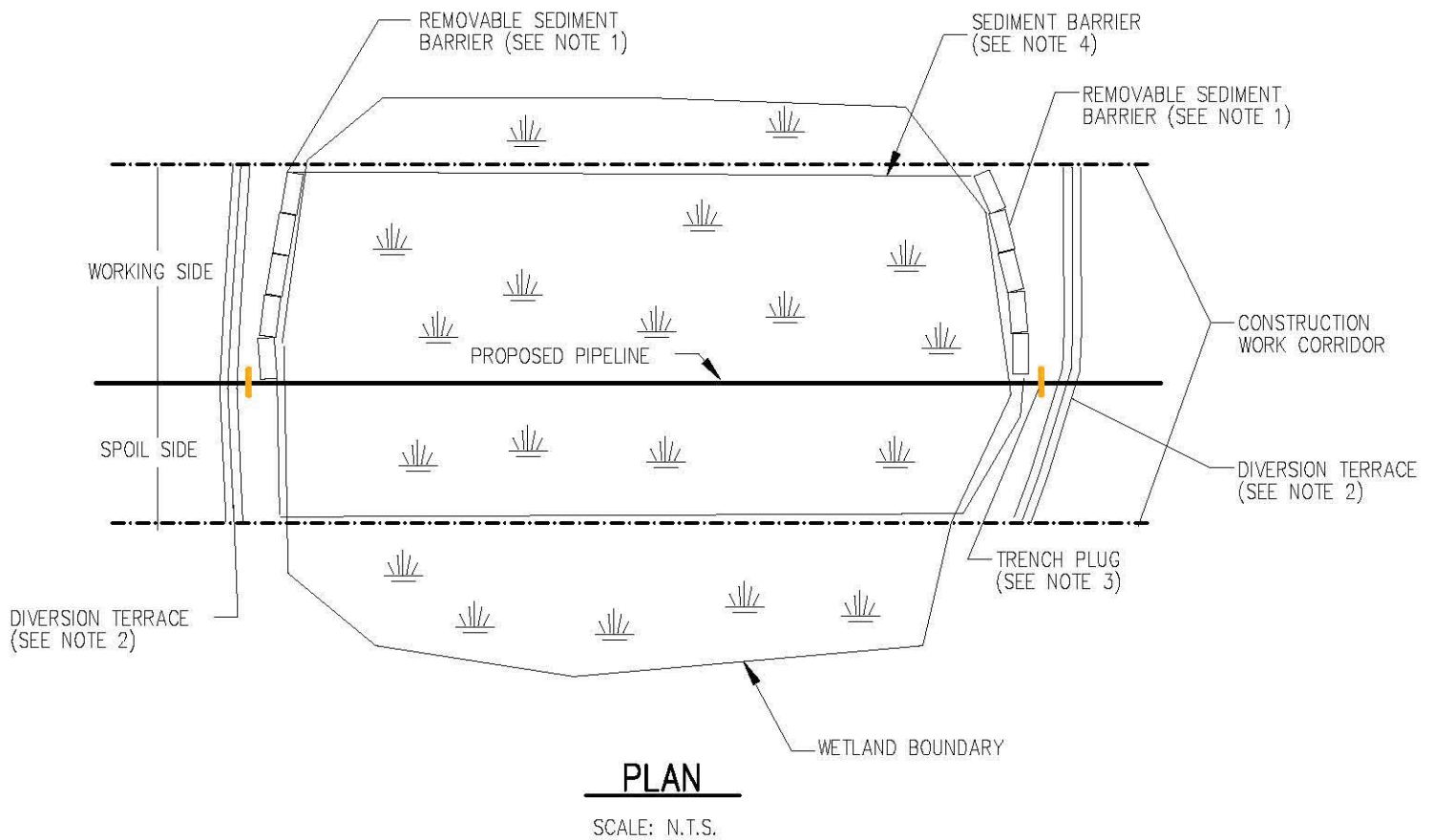
DRAWING NO.		REFERENCE TITLE									
		<p align="center"> TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC TYPICAL RIGHT-OF-WAY CROSS-SECTION SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA </p> 									
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: FH	DATE: 01/09/18	ISSUED FOR BID:	SCALE: NTS	
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							WO: 1199779	ROUTE I.D. 101-2/26/18	12:24pm 3/27/2018 K:\MAPPING\VA\MAIN\LOOP\1568_17\FERC\FERC\C\Misc\F-MANA-D-XS-01-MILEPOST TABLE.dwg	Don.Poulson	SHEET 13 OF 13



FIGURE 2
TYPICAL WETLAND
CROSSING DRAWINGS



NOTES:

1. INSTALL REMOVABLE SEDIMENT BARRIERS (HAY BALES) OR DRIVEABLE BERMS ACROSS THE TRAVEL LANE AT BOTH WETLAND BOUNDARIES. THE REMOVABLE SEDIMENT BARRIERS CAN BE REMOVED DURING THE CONSTRUCTION DAY, BUT MUST BE RE-INSTALLED AFTER CONSTRUCTION HAS STOPPED FOR THE DAY AND/OR WHEN HEAVY PRECIPITATION IS IMMINENT.
2. INSTALL DIVERSION TERRACES IMMEDIATELY UPSLOPE OF BOTH WETLAND BOUNDARIES TO PREVENT SEDIMENT FROM ENTERING THE WETLAND.
3. INSTALL TRENCH PLUGS AT BOTH WETLAND BOUNDARIES TO PREVENT DIVERSION OF WATER INTO UPLAND PORTIONS OF THE PIPELINE TRENCH AND TO KEEP ANY ACCUMULATED UPLAND TRENCH WATER OUT OF WETLAND.
4. FOR TYPE II ("SATURATED") AND TYPE III ("FLOODED") WETLANDS, INSTALL SEDIMENT BARRIERS AT WETLAND BOUNDARIES AND ALONG BOTH WETLAND EDGES. FOR TYPE I ("DRY") WETLANDS, INSTALL SEDIMENT BARRIERS AT WETLAND BOUNDARIES, ALONG THE EDGE OF THE SPOIL SIDE OF THE CONSTRUCTION CORRIDOR AND ALONG THE DOWNSLOPE EDGE OF THE WETLAND. IF THE DOWNSLOPE EDGE OF THE WETLAND IS THE SPOIL SIDE, THEN SEDIMENT BARRIERS ARE NOT REQUIRED ON THE WORKING SIDE OF THE CORRIDOR UNLESS EQUIPMENT TRAVERSING THROUGH THE WETLAND CAUSES SPOIL AND SEDIMENT TO EXIT THE CONSTRUCTION CORRIDOR.

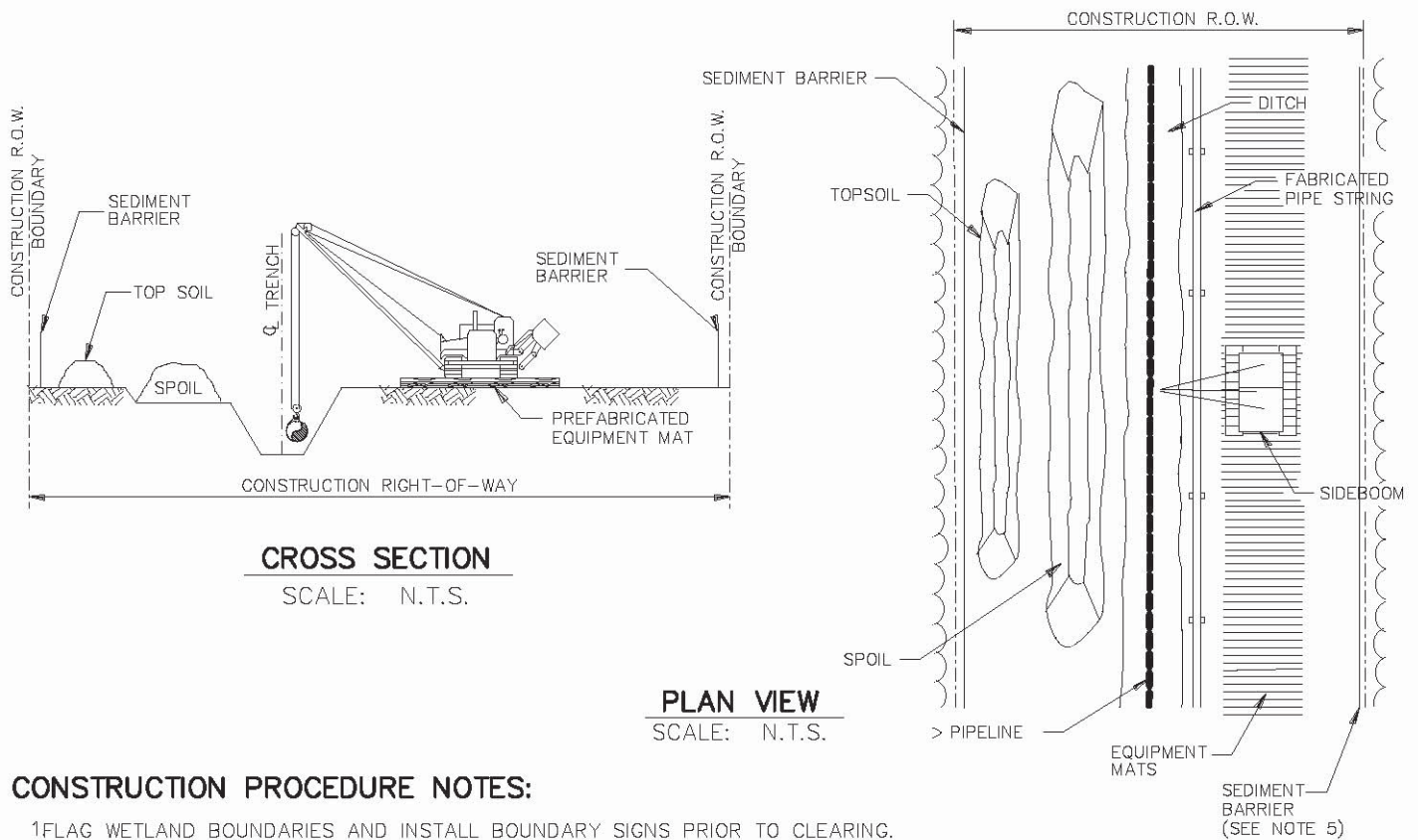
**WETLAND CROSSING CONFIGURATION
(TYPE I, II AND III WETLANDS)**

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL

WETLAND CROSSING CONFIGURATION
TYPE I, II AND III WETLANDS





CONSTRUCTION PROCEDURE NOTES:

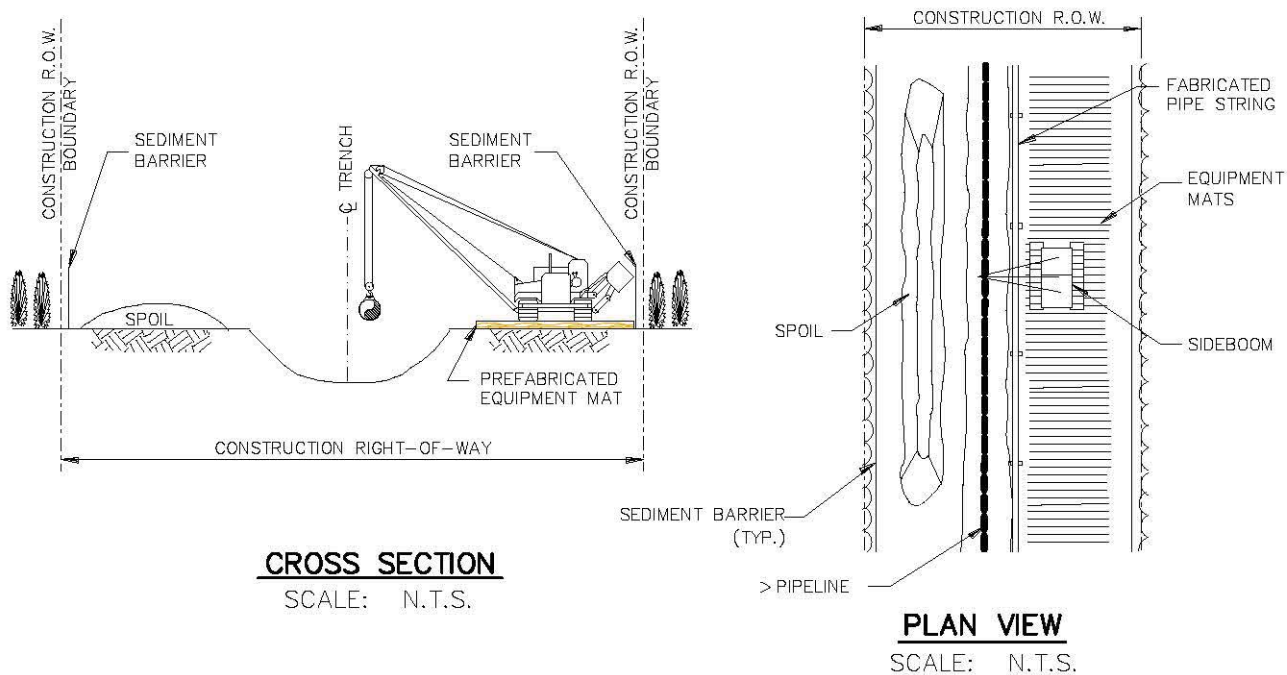
- 1 FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
- 2 NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
- 3 INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
- 4 INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
- 5 AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF THE WETLAND. INSTALL SEDIMENT BARRIERS ALONG THE EDGE OF THE SPOIL SIDE OF THE CONSTRUCTION CORRIDOR THROUGH THE WETLAND AND ALONG THE DOWN SLOPE EDGE OF THE WETLAND. IF THE DOWN SLOPE EDGE OF THE WETLAND IS THE SPOIL SIDE, THEN SEDIMENT BARRIERS ARE NOT REQUIRED ON THE WORKING SIDE OF THE CORRIDOR UNLESS EQUIPMENT TRAVERSING THROUGH THE WETLAND CAUSES SPOIL AND SEDIMENT TO EXIT THE CONSTRUCTION CORRIDOR.
- 6 LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCH LINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY-RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
- 7 CONDUCT TRENCH LINE TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED). SALVAGE TOPSOIL TO ACTUAL DEPTH OR A MAXIMUM DEPTH OF 12 INCHES, AS DETERMINED BY THE COMPANY ENVIRONMENTAL INSPECTOR. SEGREGATED TOPSOIL PILE MAY BE LOCATED ON SPOIL SIDE, AS REQUIRED.
- 8 LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
- 9 TRENCHING THROUGH WETLANDS MAY PROCEED WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEED CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACKFILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
- 10 PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
- 11 LOWER-IN PIPE. PRIOR TO BACK FILLING TRENCH, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
- 12 RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.
- 13 REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
- 14 SEED DISTURBED WETLANDS AREA AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL

TYPE I "DRY WETLAND"
INSTALLATION PROCEDURE





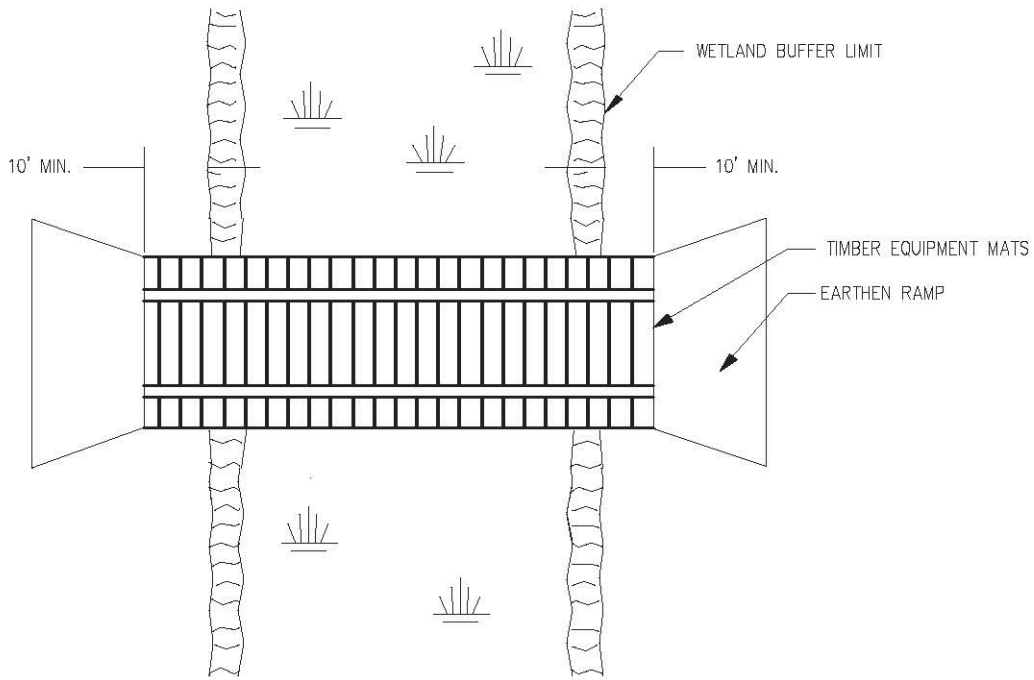
CONSTRUCTION PROCEDURE NOTES:

- 1 FLAG WETLAND BOUNDARIES AND INSTALL BOUNDARY SIGNS PRIOR TO CLEARING.
- 2 NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
- 3 INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
- 4 INSTALL PREFABRICATED EQUIPMENT MATS THROUGH ENTIRE WETLAND AREA ON THE WORKING SIDE OF THE CONSTRUCTION CORRIDOR.
- 5 AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
- 6 LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER THE TRENCHLINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
- 7 TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
- 8 LEAVE HARD PLUGS AT THE EDGES OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
- 9 TRENCHING THROUGH WETLANDS MAY PROCEED WHEN THE PIPE SECTION IS FABRICATED AND READY TO LAY. ONCE TRENCHING COMMENCES, CONSTRUCTION THROUGH THE WETLAND IS TO PROCEED CONTINUOUSLY UNTIL THE CROSSING IS COMPLETED, BACKFILLED AND RESTORED IN ORDER TO MINIMIZE THE LENGTH OF TIME THE TRENCH IS OPEN.
- 10 PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND ADJACENT TO PIPE TRENCH, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY, UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
- 11 LOWER-IN PIPE. PRIOR TO BACKFILLING, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS.
- 12 RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
- 13 REMOVE PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
- 14 SEED DISTURBED WETLAND AREA AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR AND AS SHOWN ON DRAWINGS.

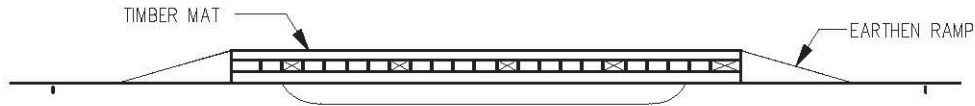
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TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL
TYPE II "SATURATED WETLAND"
INSTALLATION PROCEDURE





PLAN VIEW
SCALE: N.T.S.



ELEVATION
SCALE: N.T.S.

NOTES:

1. PERIODICALLY CHECK INSTALLATION AND REMOVE BUILD-UP OF SEDIMENT OR DEBRIS.
2. MATERIALS PLACED IN WETLANDS SHALL BE COMPLETELY REMOVED DURING FINAL CLEAN-UP. REMOVAL OF THIS STRUCTURE IS NOT CONTINGENT UPON ESTABLISHMENT OF PERMANENT VEGETATION.
3. IF A WATERBODY IS LOCATED WITHIN A WETLAND SYSTEM, EXTEND TIMBER EQUIPMENT MATS TO THE BRIDGE EQUIPMENT CROSSING (BEC) USED TO CROSS THE WATERBODY IN ORDER TO ALLOW FOR CONTINUOUS TIMBER EQUIPMENT MAT COVERAGE THROUGH THE WETLAND AND WATERBODY AREA.
4. USE ADDITIONAL TIMBER MAT LAYERS TO RAISE CROSSING ABOVE GRADE WHERE POOR SOIL CONDITIONS EXIST.
5. TIMBER EQUIPMENT MATS SHALL EXTEND A MINIMUM OF 10 FEET OUTSIDE OF THE WETLAND BOUNDARIES.
6. INSTALL EARTHEN RAMP APPROACHES TO TIMBER EQUIPMENT MATS. EARTHEN RAMPS TO BE CONSTRUCTED OF UPLAND MATERIAL, TOP SOIL SHALL NOT BE USED TO CONSTRUCT EARTHEN RAMPS.

WETLAND EQUIPMENT CROSSING



TEMPORARY EROSION CONTROL MEASURE

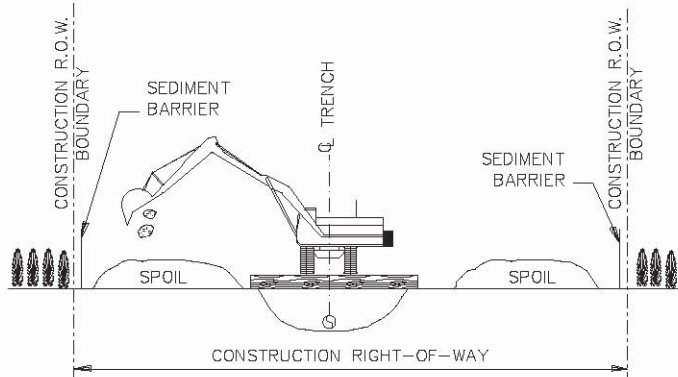
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TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL



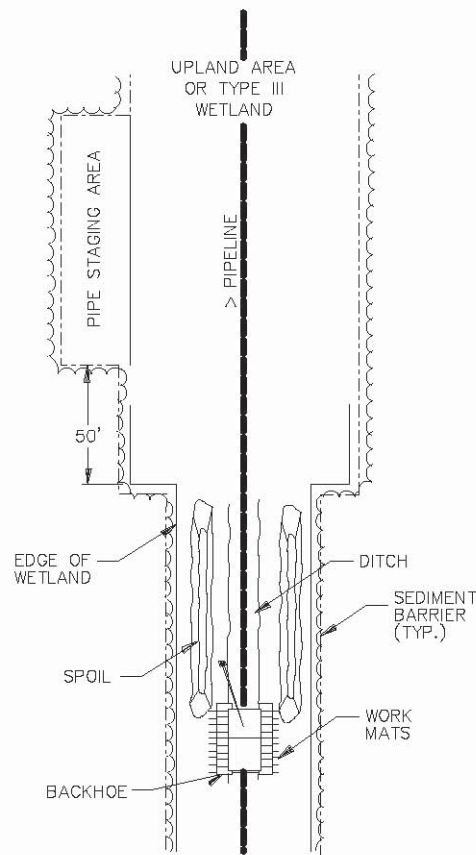
WETLAND EQUIPMENT CROSSING





CROSS SECTION

SCALE: N.T.S.



PLAN VIEW

SCALE: N.T.S.

CONSTRUCTION PROCEDURE NOTES:

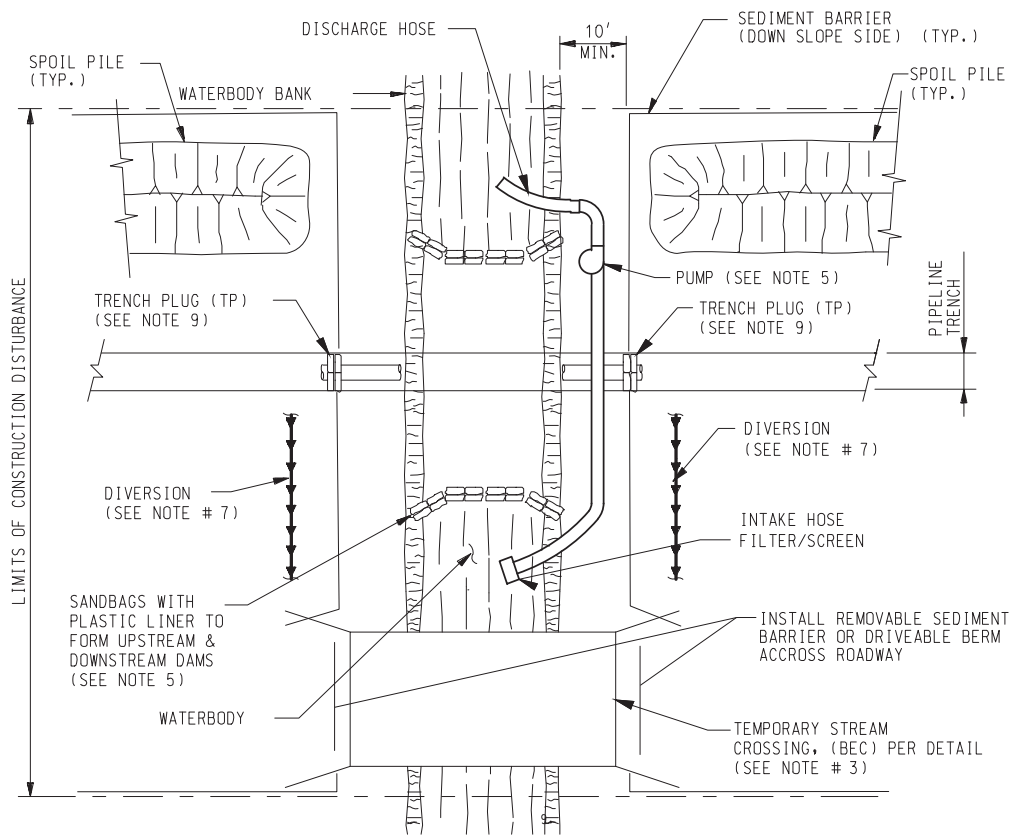
- 1 FLAG WETLAND BOUNDARIES AND INSTALL WETLAND BOUNDARY SIGNS PRIOR TO CLEARING.
- 2 NO OVERNIGHT PARKING OR REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
- 3 INSTALL TEMPORARY SLOPE BREAKERS UPSLOPE OF WETLAND BOUNDARIES AS SHOWN ON DRAWINGS AND SPECIFICATIONS.
- 4 AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS AT OUTER BOUNDARIES OF WETLAND AND ALONG BOTH WETLAND EDGES.
- 5 LIMIT PULLING OF TREE STUMPS AND GRADING ACTIVITIES TO DIRECTLY OVER TRENCHLINE. DO NOT GRADE OR REMOVE STUMPS OR ROOT SYSTEMS FROM THE REST OF THE RIGHT-OF-WAY IN WETLANDS UNLESS THE CHIEF INSPECTOR AND COMPANY ENVIRONMENTAL INSPECTOR DETERMINE THAT SAFETY RELATED CONSTRUCTION CONSTRAINTS REQUIRE REMOVAL OF TREE STUMPS FROM UNDER THE WORKING SIDE OF THE RIGHT-OF-WAY.
- 6 TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
- 7 UTILIZE AMPHIBIOUS EXCAVATORS (PONTOON MOUNTED BACKHOES) OR TRACKED BACKHOES SUPPORTED BY PREFABRICATED EQUIPMENT MATS OR FLOATS, TO EXCAVATE TRENCH. IF PREFABRICATED EQUIPMENT MATS ARE USED FOR STABILIZATION, THE BACKHOE SHALL GRADUALLY MOVE ACROSS THE WETLAND BY MOVING THE MATS FROM IMMEDIATELY BEHIND TO IMMEDIATELY IN FRONT OF THE BACKHOE'S PATH.
- 8 FABRICATE PIPE IN A STAGING AREA OUTSIDE THE TYPE III WETLAND AS INDICATED ON THE CONSTRUCTION DRAWINGS. NO CONCRETE COATING ACTIVITY WITHIN 100 FEET OF WETLAND BOUNDARY, UNLESS APPROVED BY COMPANY ENVIRONMENTAL INSPECTOR.
- 9 LEAVE HARD PLUGS AT THE EDGE OF TYPE III WETLAND UNTIL JUST PRIOR TO PIPE PLACEMENT.
- 10 FLOAT PIPE IN PLACE, LOWER-IN, INSTALL TRENCH PLUGS IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS, AND BACKFILL.
- 11 RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY AND INSTALL PERMANENT EROSION CONTROL.
- 12 REMOVE ANY MATS UTILIZED TO SUPPORT AMPHIBIOUS EQUIPMENT FROM WETLANDS UPON COMPLETION.
- 13 WETLANDS CROSSED USING PUSH/PULL METHOD TEND TO BE TOO WET FOR EFFECTIVE SEEDING. HOWEVER, IF THE SITE IS DRY ENOUGH AND IF DIRECTED BY THE ENVIRONMENTAL INSPECTOR, THE RIGHT-OF-WAY SHALL BE SEEDING IN ACCORDANCE WITH DRAWINGS.

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
 STANDARD ENVIRONMENTAL DETAIL
 TYPE III "FLOODED WETLAND"
 INSTALLATION PROCEDURE



FIGURE 3
TYPICAL DAM AND
PUMP WATERBODY
CROSSING DRAWING



PLAN

SCALE: N.T.S.

NOTES:

1. SEDIMENT BARRIERS SHALL BE INSTALLED AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVY SILT LADEN WATER ENTERS THE WATERBODY OR LEAVES THE CONSTRUCTION RIGHT-OF-WAY
2. HARD DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL THE WATERBODY CROSSING IS INSTALLED AND BACKFILLED.
3. EQUIPMENT OPERATING IN THE WATERBODY SHALL BE LIMITED TO THAT NEEDED TO PERFORM CONSTRUCTION. IF OTHER TYPES OF EQUIPMENT MUST CROSS THE WATERBODY, CONTRACTOR SHALL PROVIDE AND USE A TEMPORARY STREAM CROSSING (BEC).
4. STAGING AREA(S) FOR WATERBODY CROSSING(S), WHEN REQUIRED, SHALL BE LOCATED AT LEAST 50 FEET FROM WATER'S EDGE AND SHALL BE OF A MINIMUM SIZE NEEDED FOR CONVENIENT PREPARATION.
5. IMPLEMENTATION OF THE DAM-AND-PUMP CROSSING METHOD MUST MEET THE FOLLOWING PERFORMANCE CRITERIA:
 - (A) USE SUFFICIENT PUMPS, INCLUDING ON-SITE BACKUP PUMPS, TO MAINTAIN DOWNSTREAM FLOWS.
 - (B) CONSTRUCT DAMS WITH MATERIALS THAT PREVENT SEDIMENT AND OTHER POLLUTANTS FROM ENTERING THE WATERBODY (E.G., SANDBAGS OR CLEAN GRAVEL WITH PLASTIC LINER).
 - (C) SCREEN PUMP INTAKES;
 - (D) PREVENT STREAMBED SCOUR AT PUMP DISCHARGE.
 - (E) MONITOR THE DAM AND PUMPS TO ENSURE PROPER OPERATION THROUGHOUT THE WATERBODY CROSSING.
6. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED DAILY AND REPAIRED IF NECESSARY.
7. INSTALL DIVERSION TRENCHES AT THE BASE OF ALL SLOPES ADJACENT TO THE WATERBODY.
8. CHEMICALS, FUELS AND LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT SHALL NOT BE REFUELED WITHIN 100 FEET OF THE WATERBODY.
9. INSTALL TRENCH PLUGS ON BOTH SIDES OF THE WATERBODY TO PREVENT DIVERSION OF WATER INTO UPLAND PORTIONS OF THE PIPELINE TRENCH AND TO KEEP ANY ACCUMULATED TRENCH WATER OUT OF THE WATERBODY.
10. CONTRACTOR SHALL POSTPONE GRADING OF RIGHT-OF-WAY ADJACENT TO WATERBODY UNTIL STAGING AREA IS PREPARED AND WORK IN THE WATERBODY IS READY TO COMMENCE.

DAM AND PUMP CROSSING

TEMPORARY EROSION CONTROL MEASURE

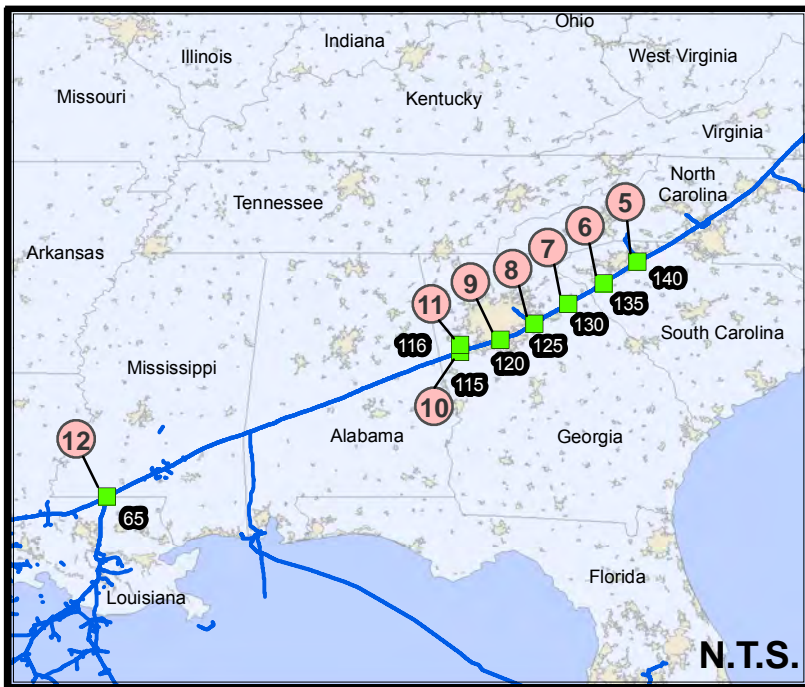
NO.	DATE	BY	REVISION DESCRIPTION	W.D.	NO.	CHK.	APP.

TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC
STANDARD ENVIRONMENTAL DETAIL

DAM AND PUMP CROSSING



APPENDIX A
PROJECT LOCATION
MAPS



**PROPOSED PROJECT SCOPE
SOUTHEASTERN TRAIL PROJECT**

PIPELINE	LENGTH IN MILES	MILEPOSTS
1) 42" Manassas Loop – Fauquier & Prince William Counties, VA	7.73	M.P. 1568.12 to M.P. 1575.85 between STA 180 & 185

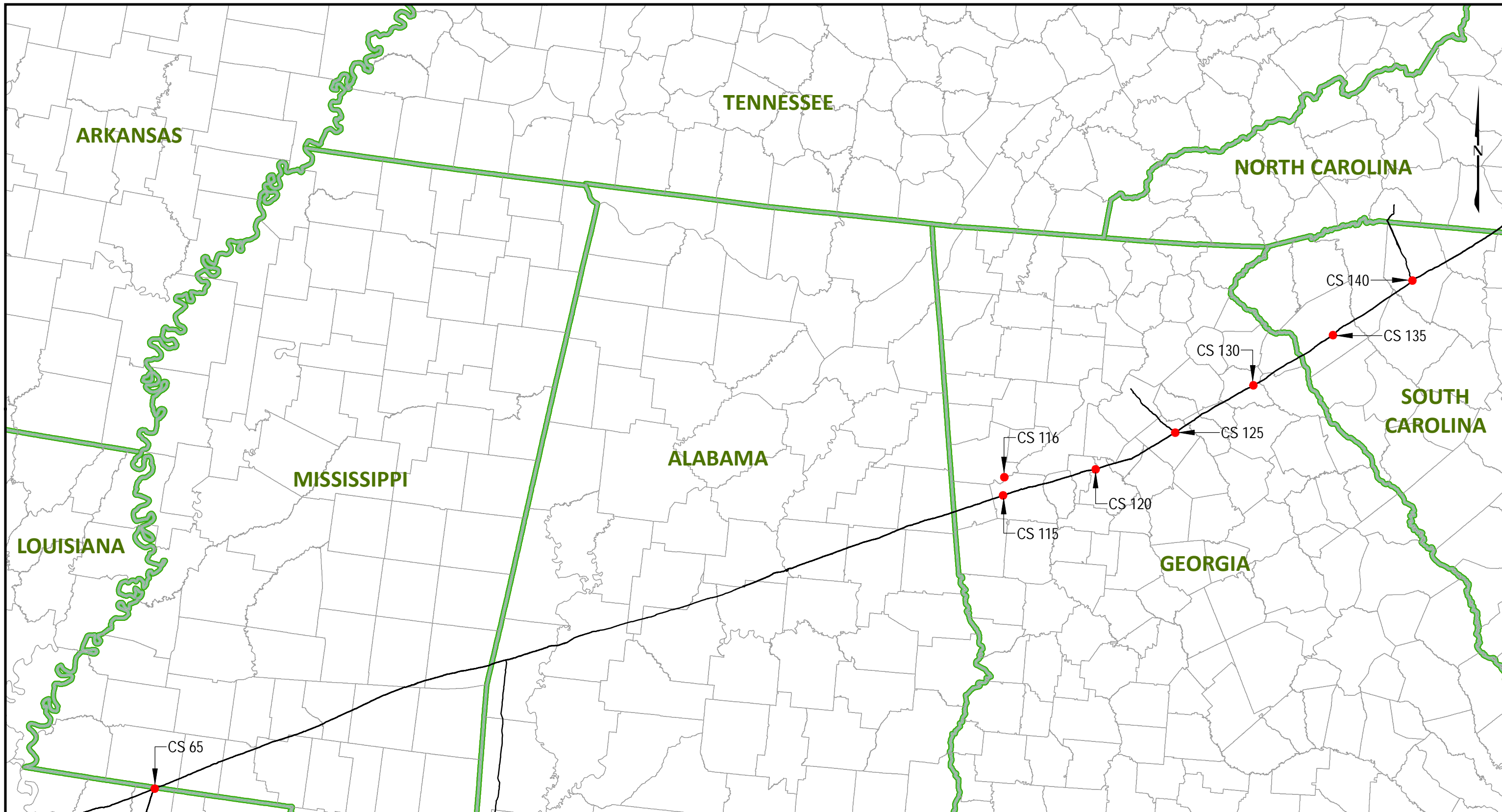
FACILITY MODIFICATIONS

- 2) STA 185 – Uprate existing EMD driver from 25,000 to 30,000 HP and regear the associated variable speed drive
- 3) STA 175 – Add one 23,502 ISO HP Titan 130 compression unit and station cooling. Uprate existing EMD driver from 33,000 to 41,250 HP and rewheel the associated centrifugal compressor
- 4) STA 165 – Add two 23,502 ISO HP Titan 130 compression units, station cooling, and miscellaneous piping modifications. Demolish "A" building and replace 20,000 HP
- 5) STA 140 – Reverse station
- 6) STA 135 – Add deodorization facilities
- 7) STA 130 – Reverse station and add deodorization facilities
- 8) STA 125 – Add deodorization facilities
- 9) STA 120 – Add deodorization facilities
- 10) STA 116 – Add deodorization facilities
- 11) STA 115 – Reverse station and add deodorization facilities
- 12) STA 65 – Reverse station

LEGEND

- EXISTING TRANSCO COMPRESSOR STATION
- EXISTING TRANSCO PIPELINE
- PROPOSED PIPELINE
- URBAN AREAS

N.T.S.

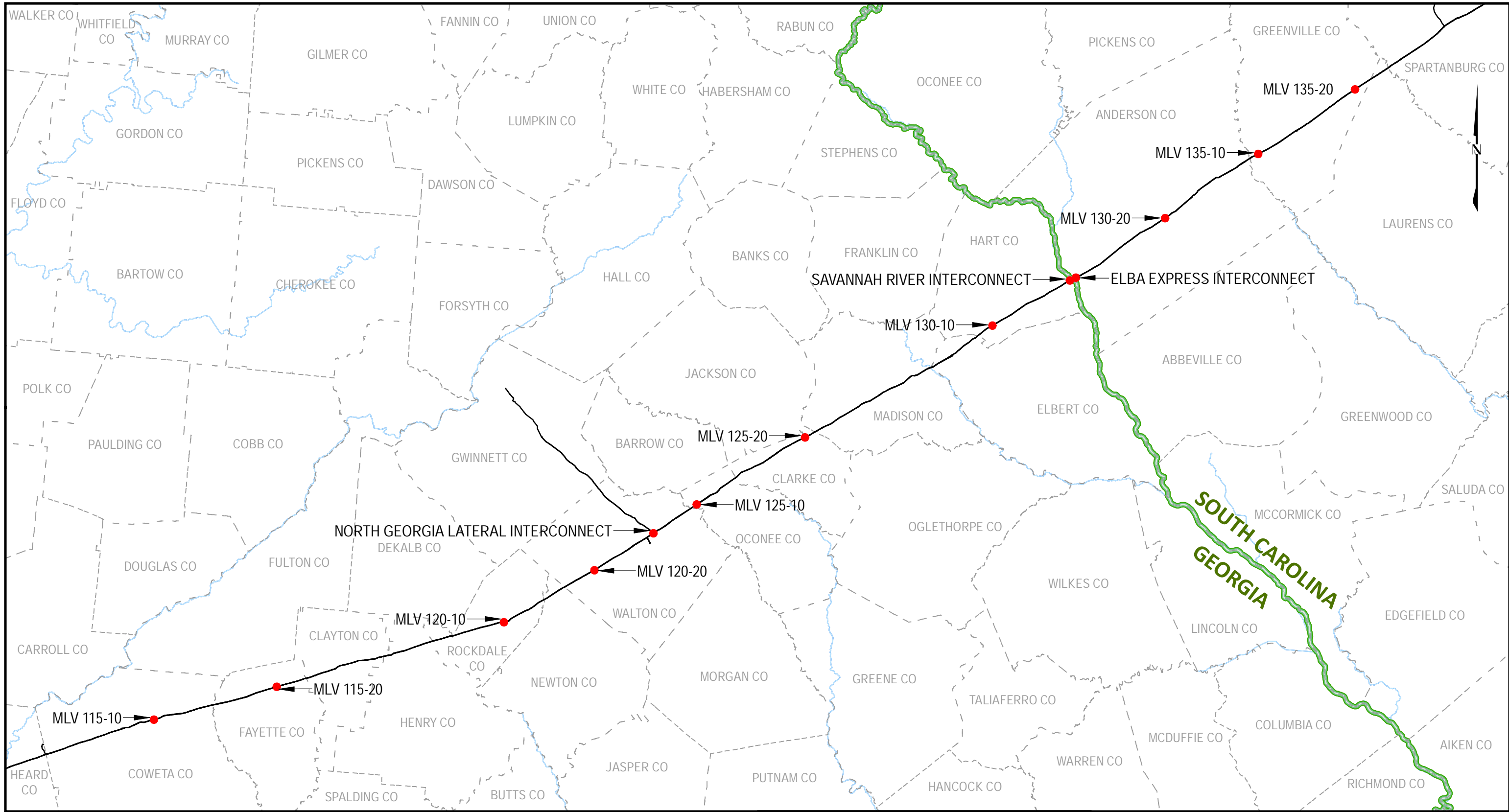


LEGEND

- MAINLINE FACILITIES
- EXISTING TRANSCO LINES
- - - COUNTY BOUNDARY
- STATE BOUNDARY



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC PROJECT OVERVIEW MAINLINE FACILITY STATION LOCATION MAP SOUTHEASTERN TRAIL PROJECT LOUISIANA, SOUTH CAROLINA & GEORGIA						
FIGURE 1-1b										
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: CNC	DATE: 09/07/17	ISSUED FOR BID:	SCALE: 1"=40mi.
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							WO: 1200766	8:21 AM	4/4/2018	



LEGEND

- MAIN LINE VALVE
- EXISTING TRANSCO LINES
- - - COUNTY BOUNDARY
- STATE BOUNDARY

SCALE IN MILES

DRAWING NO.		REFERENCE TITLE				
FIGURE 1-1c						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	CNC	ISSUED FOR FERC FILING	1200767	EL	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 PROJECT OVERVIEW
 MAIN LINE VALVE LOCATION MAP
 SOUTHEASTERN TRAIL PROJECT
 SOUTH CAROLINA & GEORGIA

DRAWN BY: CNC	DATE: 09/07/17	ISSUED FOR BID:	SCALE: 1"=12mi.
CHECKED BY: EL	DATE: 09/07/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/07/17	DRAWING NUMBER: F-MANA-D-LM-02	SHEET 1 OF 1
WO: 1200767	8:22 AM 4/4/2018		

APPENDIX B
PROJECT ALIGNMENT
SHEETS



20180411-5132 FERC PDF (Unofficial) 04/11/2018

Transcontinental Gas Pipe Line Company LLC
FERC ALIGNMENT SHEETS
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
M.P. 1568.13 TO M.P. 1575.85 (7.72 MILES)
FAUQUIER AND PRINCE WILLIAM COUNTIES , VIRGINIA

DRAWING NUMBER	SHEET	REV.
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F-MANA-D-AS-01	2 OF 39	0
F-MANA-D-AS-01	3 OF 39	0
F-MANA-D-AS-01	4 OF 39	0
F-MANA-D-AS-01	5 OF 39	0
F-MANA-D-AS-01	6 OF 39	0
F-MANA-D-AS-01	7 OF 39	0
F-MANA-D-AS-01	8 OF 39	0
F-MANA-D-AS-01	9 OF 39	0
F-MANA-D-AS-01	10 OF 39	0
F-MANA-D-AS-01	11 OF 39	0
F-MANA-D-AS-01	12 OF 39	0
F-MANA-D-AS-01	13 OF 39	0

DRAWING NUMBER	SHEET	REV.
F-MANA-D-AS-01	14 OF 39	0
F-MANA-D-AS-01	15 OF 39	0
F-MANA-D-AS-01	16 OF 39	0
F-MANA-D-AS-01	17 OF 39	0
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DRAWING NUMBER	SHEET	REV.
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F-MANA-D-AS-01	39 OF 39	0

ISSUED DATE: 04/04/2018

MILEPOSTS

M.P. 1568.13 BEGIN PROPOSED 42" MANASSAS LOOP,
PROPOSED MAIN LINE VALVE 180D15

M.P. 1568.14 PROPOSED FENCE

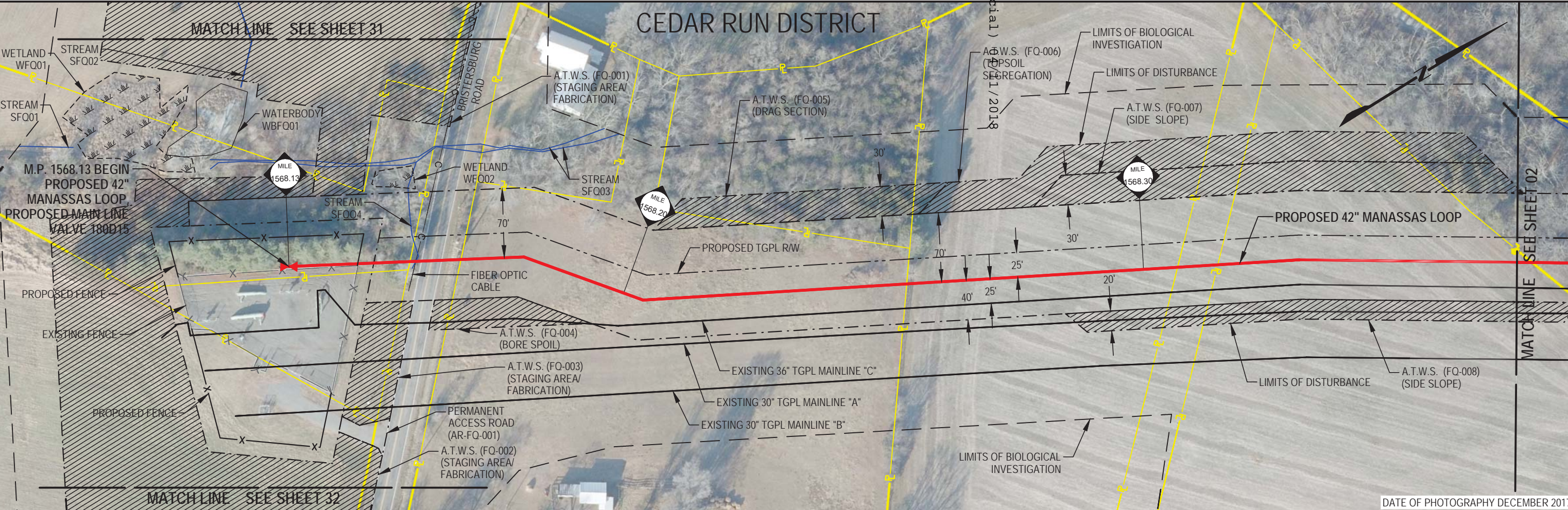
M.P. 1568.15 FIBER OPTIC CABLE
M.P. 1568.15 & STREAM (SFO04)

M.P. 1568.16 & BRISTERSBURG ROAD

M.P. 1568.20

20180411-5132 FERC PDF (Unofficial)

M.P. 1568.30



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-002.000 7921-02-3933-000	BRISTERSBURG ROAD VA-FA-002.5.RD	VA-FA-006.000 7921-03-8333-000	VA-FA-011.000 7921-13-0644-000	VA-FA-009.000 7921-13-2630-000	VA-FA-013.000 7921-13-5861-000
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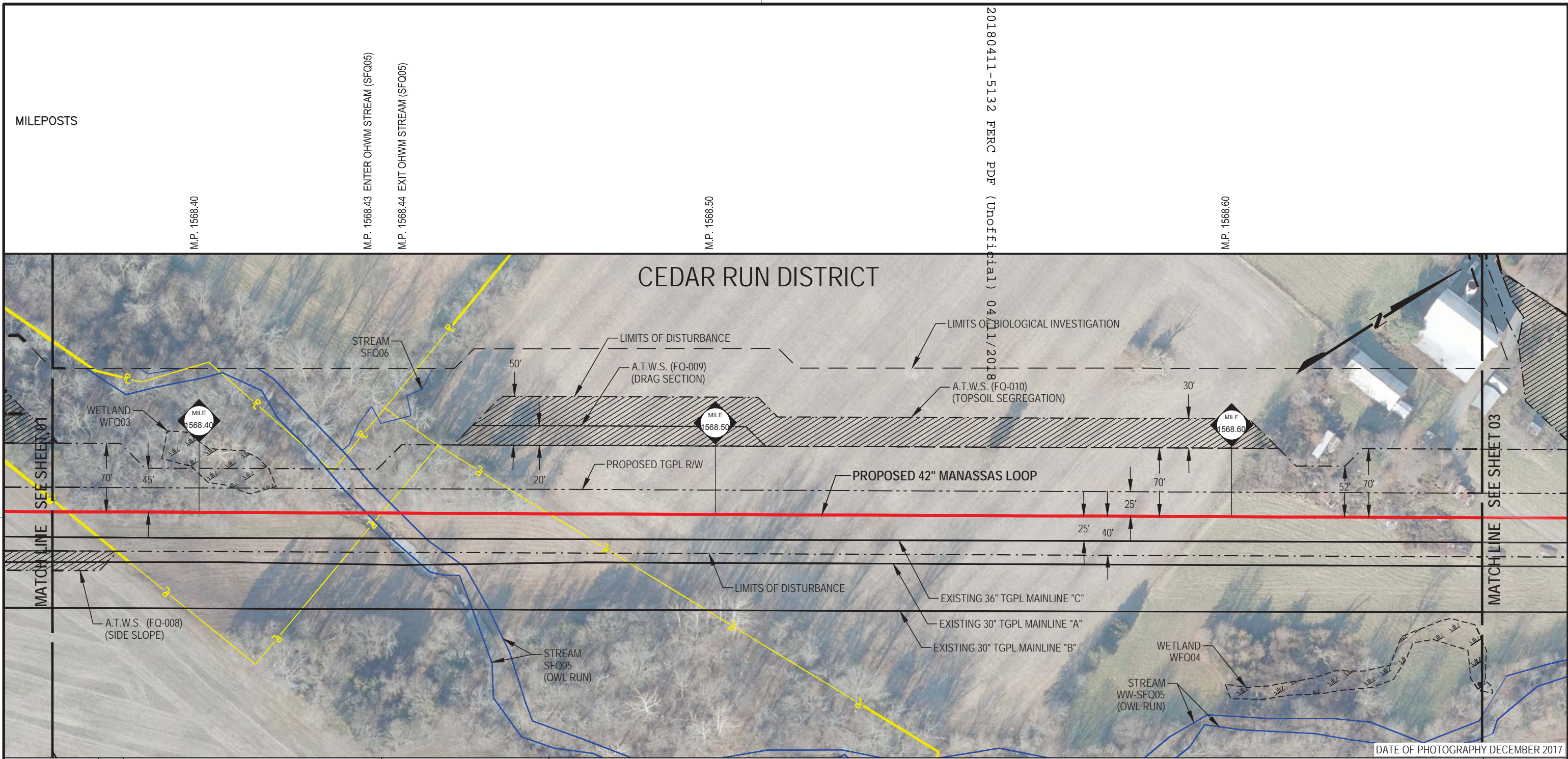
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- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
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						WO: 1199779		ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	K:\MAPPING\VA\MAIN\LOOP\1568_17\FERC\FERC\Align\1568_17_Sht 1-10.dwg		

CEDAR RUN DISTRICT



OWNERSHIP	VA-FA-013.000 7921-13-5861-000	VA-FA-015.000 7921-14-0197-000	VA-FA-013.000 7921-13-5861-000	VA-FA-017.000 7921-25-4803-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

WOOD GROUP USA, INC.

DRAWING NO.	REFERENCE TITLE
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TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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DRAWN BY: MH

CHECKED BY: W.

APPROVED BY: MJH

WO: 1199779

DATE: 09/20/17

DATE: 09/21/17

DATE: 09/22/17

ISSUED FOR BID:

ISSUED FOR CONSTRUCTION:

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REVISION: 0

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SHEET 02 OF 39

MILEPOSTS

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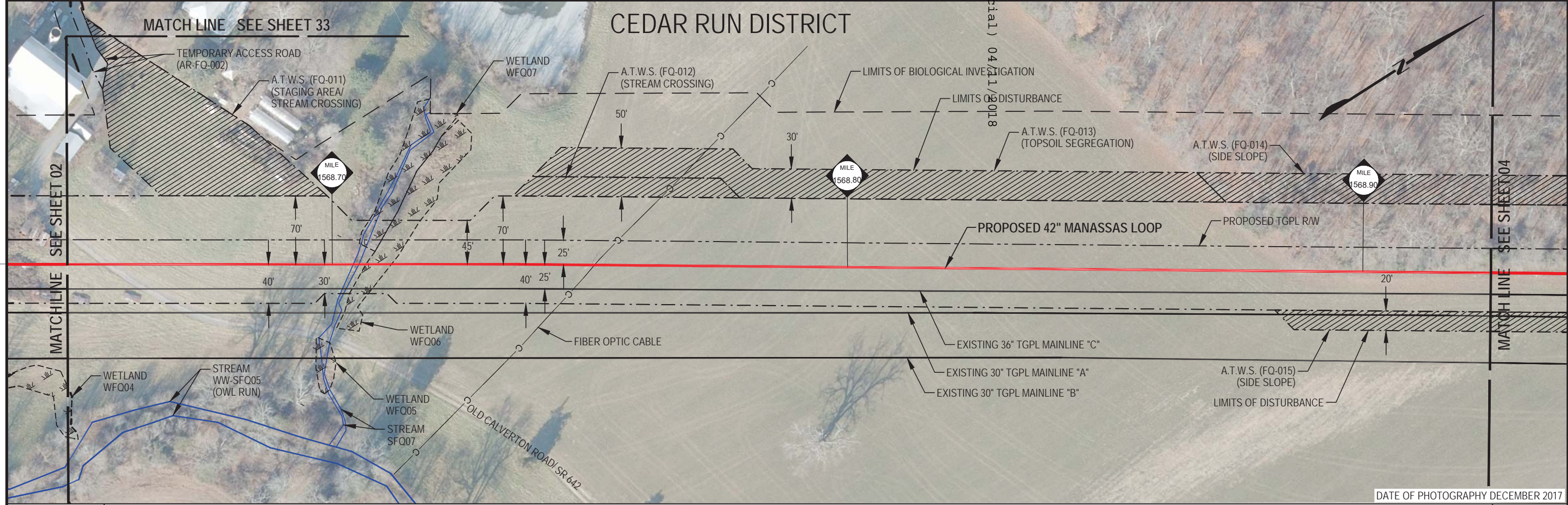
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M.P. 1568.70 ENTER WETLAND (WFQ06)
M.P. 1568.71 EXIT WETLAND (WFQ06)

M.P. 1568.75 FIBER OPTIC CABLE

M.P. 1568.80

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1568.90



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-017.000
7921-25-4803-000



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



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NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA



DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

M.P. 1569.00

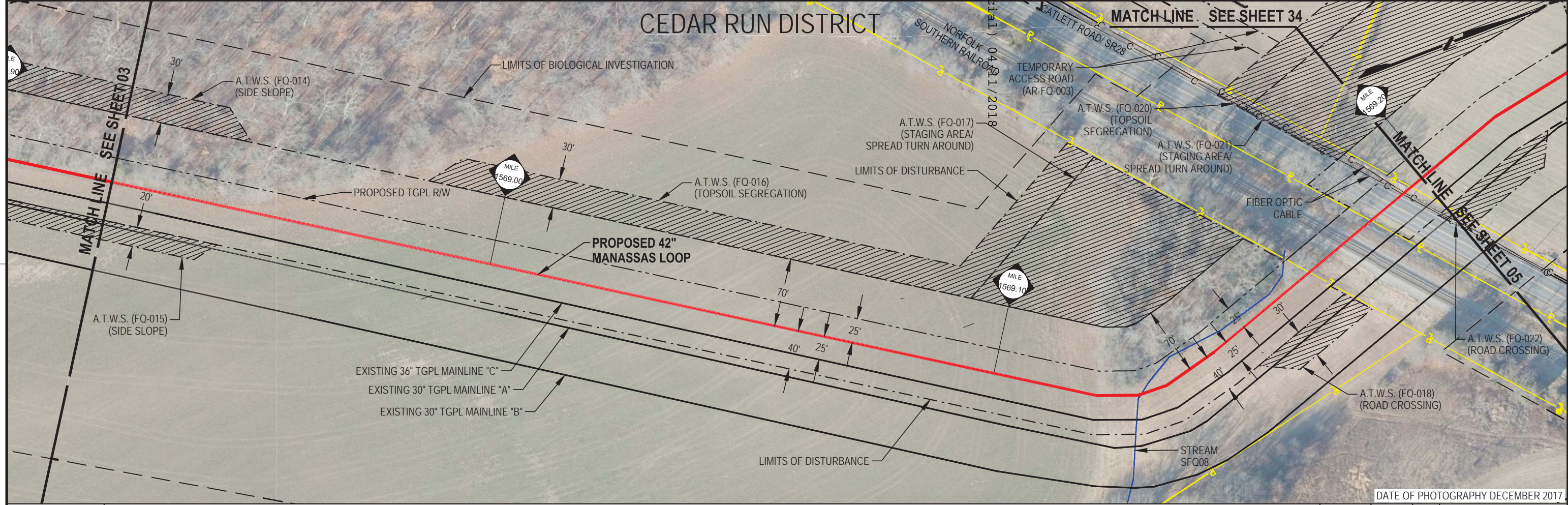
20180411-5132 FERC PDF (Official) 04/04/2018

M.P. 1569.12 & STREAM (SFO08)

M.P. 1569.16 & NORFOLK SOUTHERN RAILROAD

M.P. 1569.19 & CATLETT ROAD / SR 28
M.P. 1569.19 FIBER OPTIC CABLE

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-017.000
7921-25-4803-000

NORFOLK SOUTHERN RAILROAD
VA-FA-018.5RR

CATLETT ROAD / SR 28
VA-FA-018.5.RD

VA-FA-022.000
7921-29-0530-000



- LEGEND**
- PROPOSED 42" MANASSAS LOOP
 - EXISTING PIPELINES
 - EXISTING TGPL R/W
 - - - LIMITS OF DISTURBANCE
 - PROPOSED TGPL R/W
 - PROPERTY LINE
 - STREAM CROSSING
 - WETLAND AREA
 - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
 - X — PROPOSED FENCE
 - X — EXISTING FENCE
 - C — FIBER OPTIC CABLE
 - - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC						
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NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

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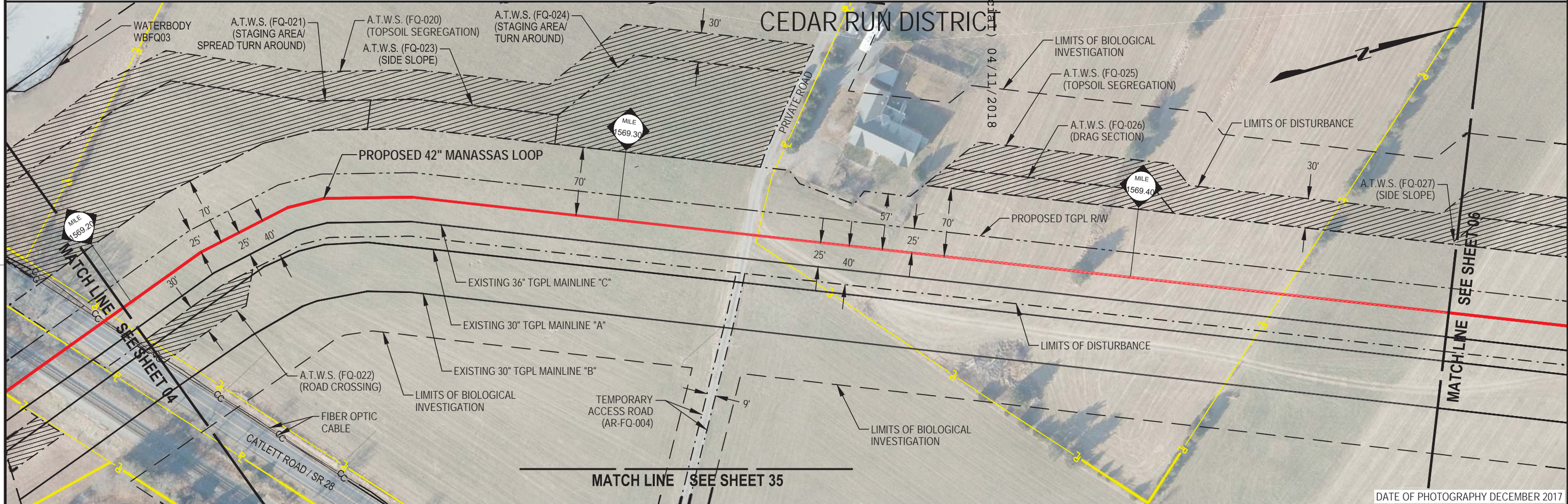
M.P. 1569.30

M.P. 1569.33 PRIVATE ROAD

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1569.40

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-022.000
7921-29-0530-000

VA-FA-021.000
7921-38-3854-000

VA-FA-022.000
7921-29-0530-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- ▨ WETLAND AREA
- ▨ ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE
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REVISION DESCRIPTION	ISSUED FOR FERC FILING
W.O. NO.	1199779
CHK.	W.
APP.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 FERC ALIGNMENT SHEET
 SOUTHEASTERN TRAIL PROJECT
 PROPOSED 42" MANASSAS LOOP
 FROM M.P. 1568.13 TO M.P. 1575.85
 FAUQUIER COUNTY, VIRGINIA



DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

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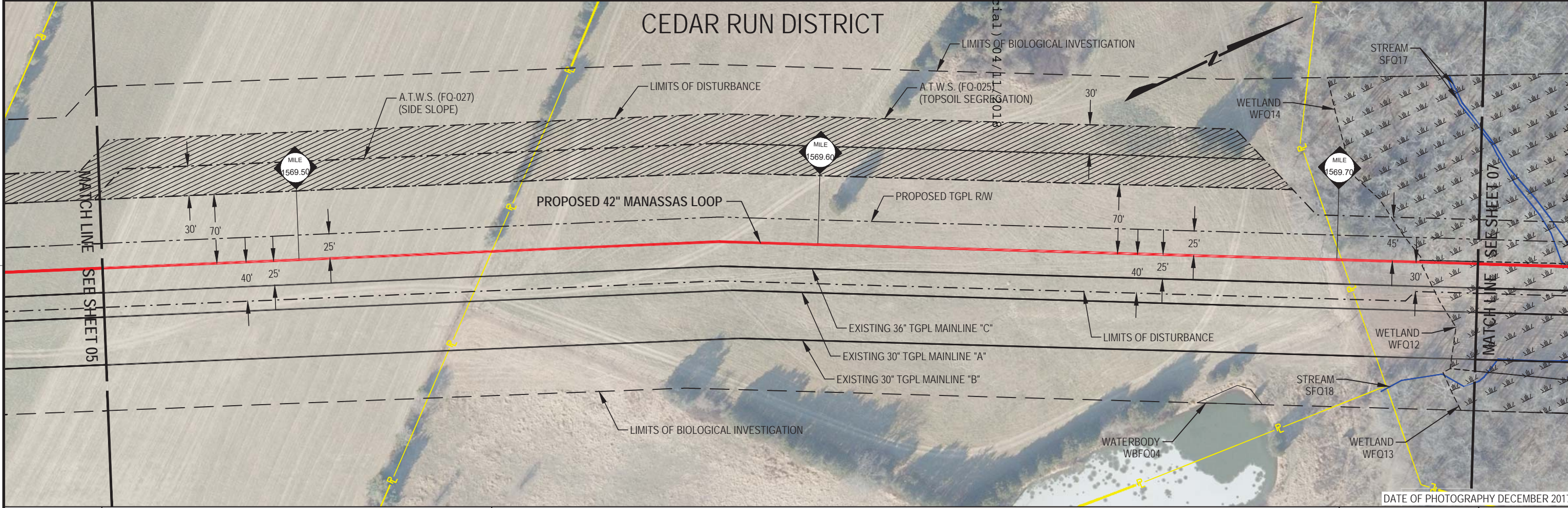
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20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1569.70

M.P. 1569.71 ENTER WETLAND (WFQ12)

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-022.000 7921-29-0530-000	VA-FA-023.000 7921-49-0572-000	VA-FA-025.000 7922-34-3184-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- P PROPERTY LINE
- STREAM CROSSING
- ▨ WETLAND AREA
- ▨ ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA								
NO.	DATE	BY	REVISION DESCRIPTION							W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0		
							APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 06 OF 39		
							WO: 1199779	ROUTE ID:101 CIVIL:02/26/18 LAND:02/26/18 ENV:02/26/18	<small> K:\MAPPING\VA\MAIN\Loop\1568_17\FERC\Align\1568_17_Sht_1-10.dwg 3/27/2018 12:33pm Mark.Ho </small>			

MILEPOSTS

M.P. 1569.74 EXIT WETLAND (WFQ12),
ENTER OHWM STREAM (SFQ17),
M.P. 1569.75 EXIT OHWM STREAM (SFQ17),
ENTER WETLAND (WFQ12)

M.P. 1569.77 EXIT WETLAND (WFQ12)

M.P. 1569.80

M.P. 1569.81 ENTER OHWM STREAM (SFQ16)

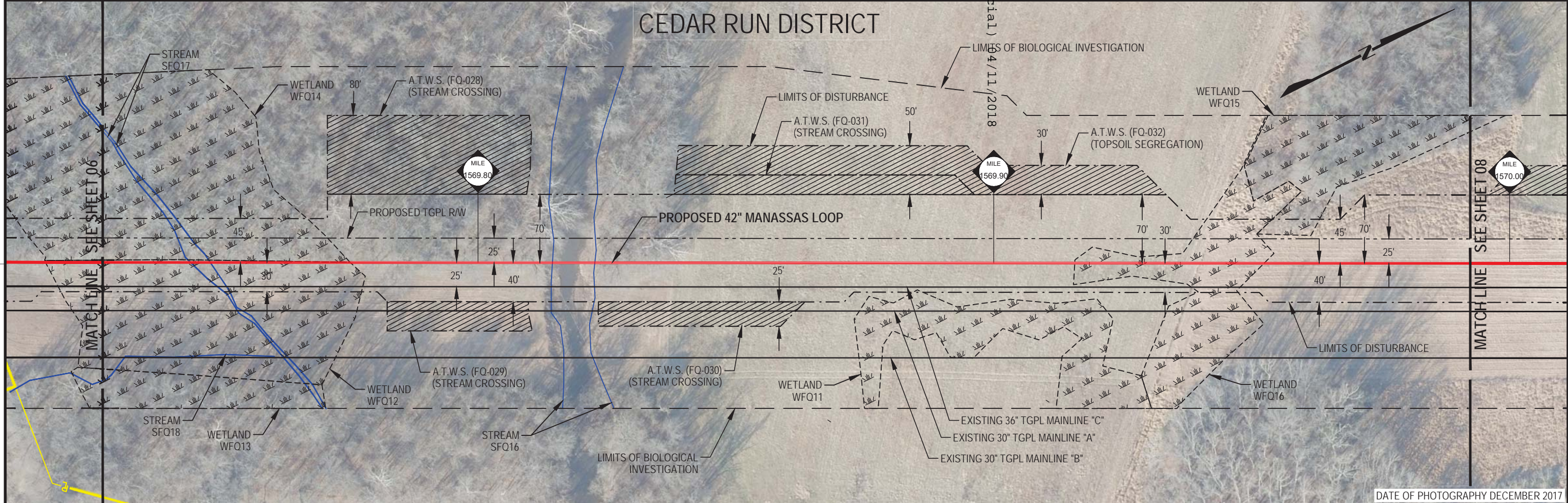
M.P. 1569.82 EXIT OHWM STREAM (SFQ16)

20180411-5132 FERC PDF (Official) 04/11/2018

M.P. 1569.91 ENTER WETLAND (WFQ16)

M.P. 1569.95 EXIT WETLAND (WFQ16)

CEDAR RUN DISTRICT



OWNERSHIP

VA-FA-025.000
7922-34-3184-000



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- - - WETLAND AREA
- - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 07
WO: 1199779	ROUTE ID:101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	12:34pm 3/27/2018	OF 39

CEDAR RUN DISTRICT

MILEPOSTS

M.P. 1570.00

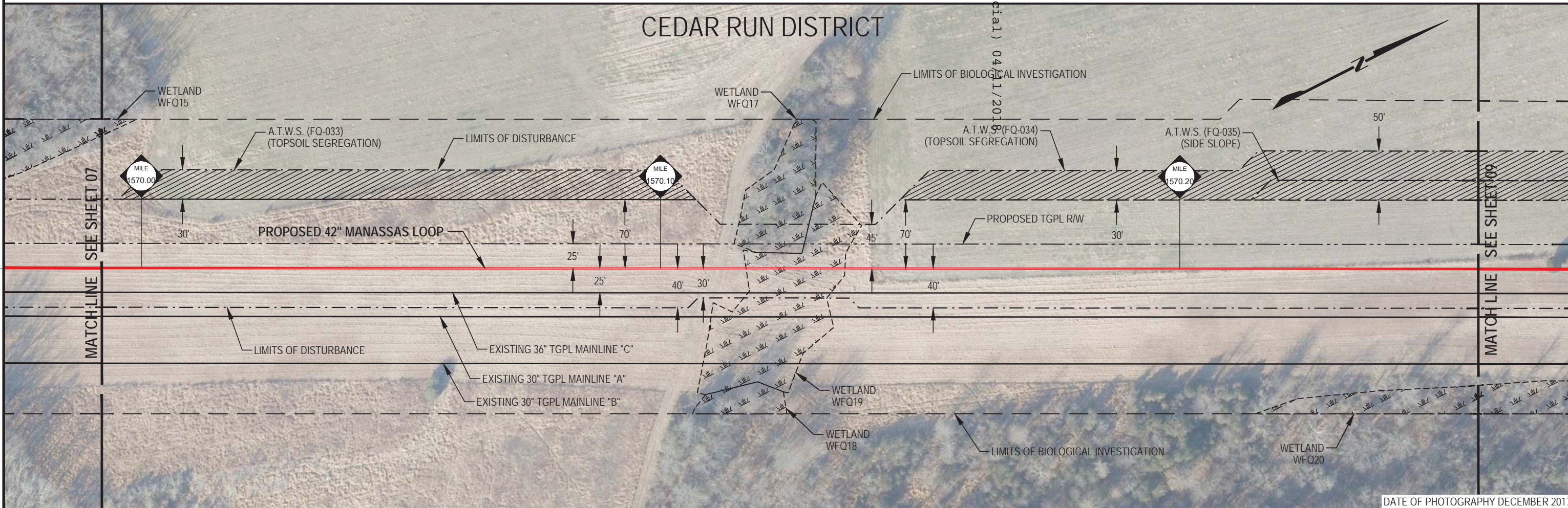
M.P. 1570.10

M.P. 1570.11 ENTER WETLAND (WFO19)

M.P. 1570.13 EXIT WETLAND (WFO19)

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1570.20



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-025.000
7922-34-3184-000



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE				
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 08
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CEDAR RUN DISTRICT

MILEPOSTS

M.P. 1570.30

M.P. 1570.37 ENTER WETLAND (WFO21)

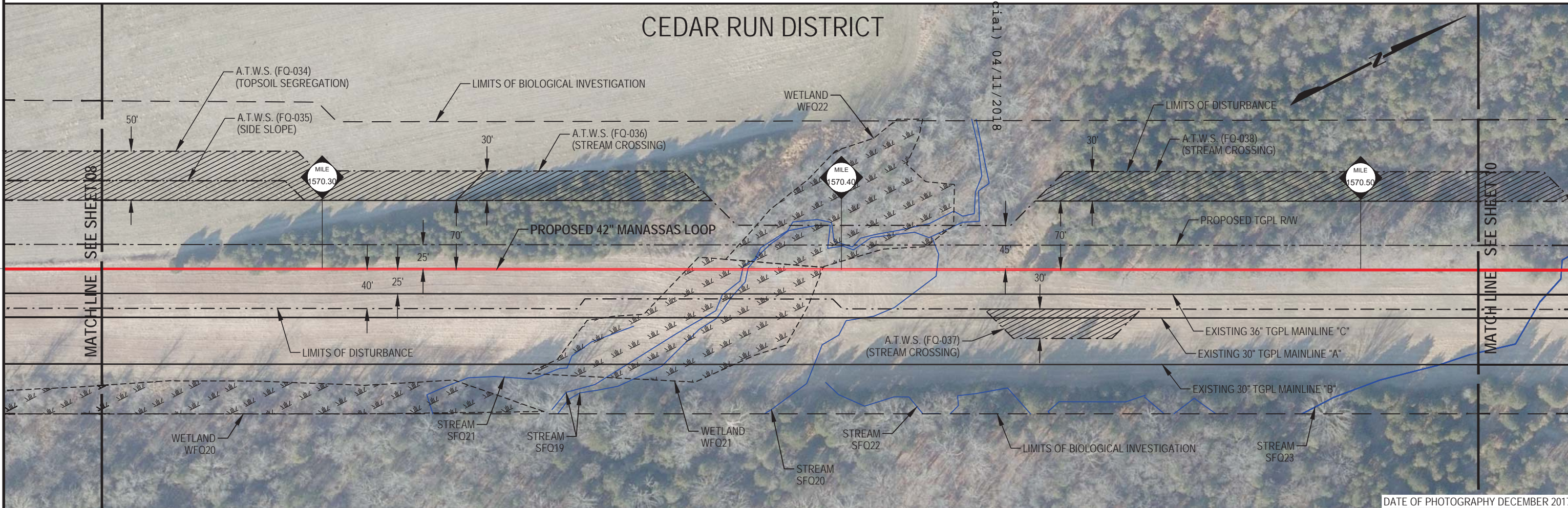
M.P. 1570.38 EXIT WETLAND (WFO21),
ENTER OHWM STREAM (SFQ19)
M.P. 1570.38 EXIT OHWM STREAM (SFQ19),
ENTER WETLAND (WFO21)

M.P. 1570.39 EXIT WETLAND (WFO21)
M.P. 1570.40

M.P. 1570.41 ½ STREAM (SFO20)

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1570.50



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-025.000
7922-34-3184-000



LEGEND	
	PROPOSED 42" MANASSAS LOOP
	EXISTING PIPELINES
	EXISTING TGPL R/W
	LIMITS OF DISTURBANCE
	PROPOSED TGPL R/W
	PROPERTY LINE
	STREAM CROSSING
	WETLAND AREA
	ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
	PROPOSED FENCE
	EXISTING FENCE
	FIBER OPTIC CABLE
	LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 09
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MILEPOSTS

M.P. 1570.53 ⚡ STREAM (SFO23)

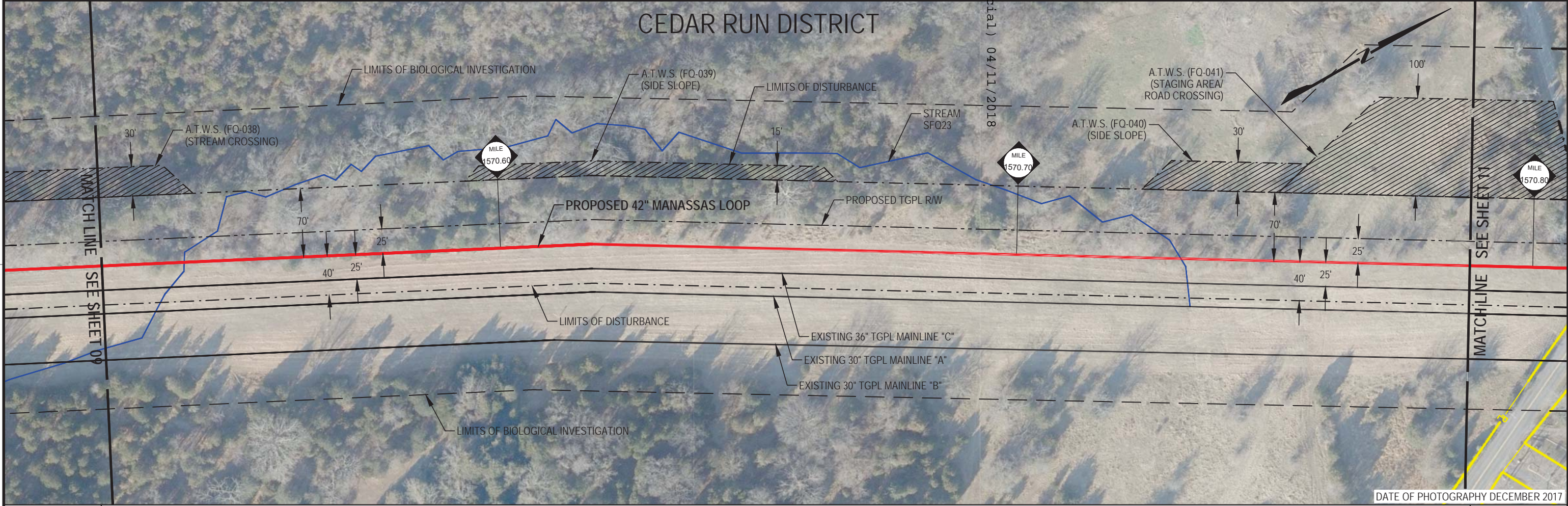
M.P. 1570.60

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1570.70

M.P. 1570.73 ⚡ STREAM (SFO23)

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-025.000
7922-34-3184-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- - - WETLAND AREA
- - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 FERC ALIGNMENT SHEET
 SOUTHEASTERN TRAIL PROJECT
 PROPOSED 42" MANASSAS LOOP
 FROM M.P. 1568.13 TO M.P. 1575.85
 FAUQUIER COUNTY, VIRGINIA



DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 10
WO: 1199779	ROUTE ID:101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/27/2018 K:\MAPPING\VA\MAIN\LOOP\1568_17\FERC\FERC\Align\1568_17_Sht_1-10.dwg	OF 39

MILEPOSTS

M.P. 1570.80

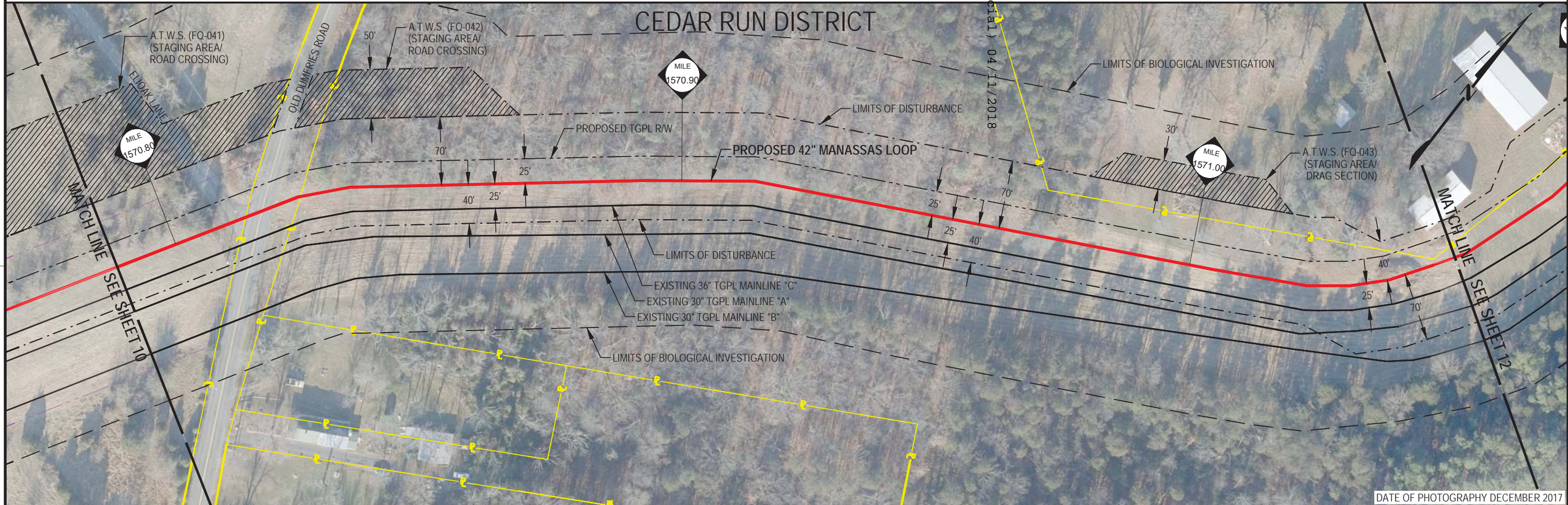
M.P. 1570.81 ELOAK LANE

M.P. 1570.82 OLD DUMFRIES ROAD

M.P. 1570.90

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1571.00



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-025.000 7922-34-3184-000	OLD DUMFRIES ROAD VA-FA-029.5.RD	VA-FA-029.000 7922-75-8804-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- P — PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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							WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 12:37pm	3/28/2018	Mark Ho	OF 39

MILEPOSTS

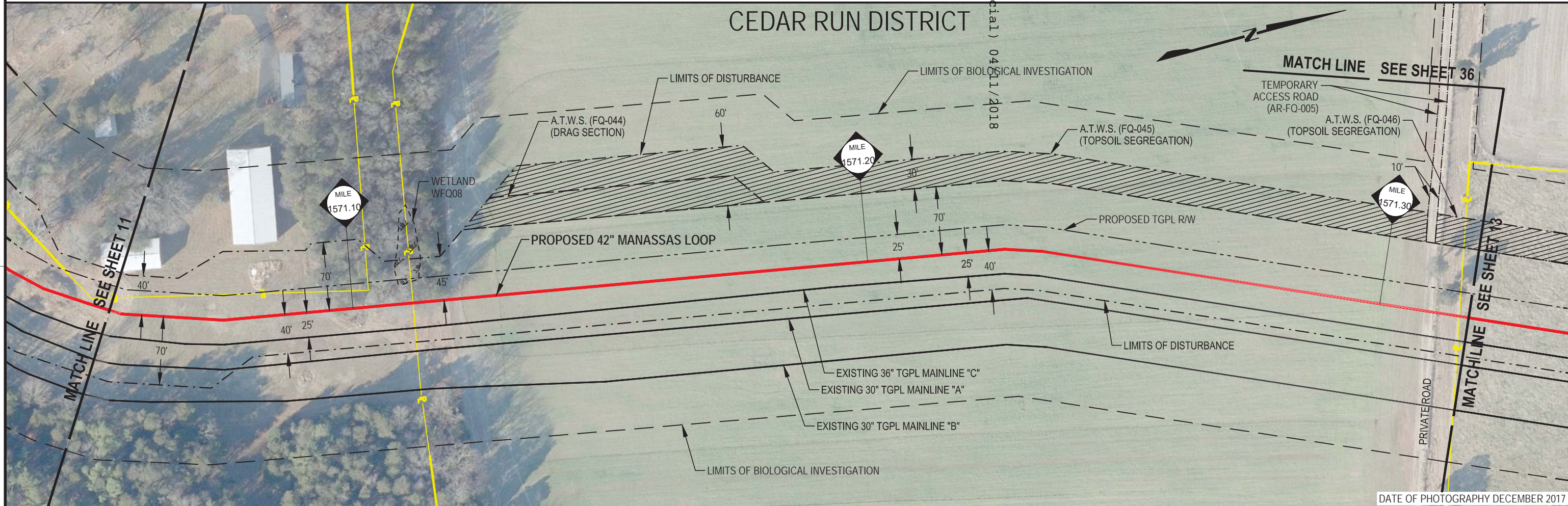
M.P. 1571.10

M.P. 1571.20

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1571.30
M.P. 1571.31 PRIVATE ROAD

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-029.000 7922-75-8804-000	VA-FA-031.000 7922-77-9322-000	VA-FA-035.000 7922-89-2275-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

**WOOD GROUP
USA, INC.**

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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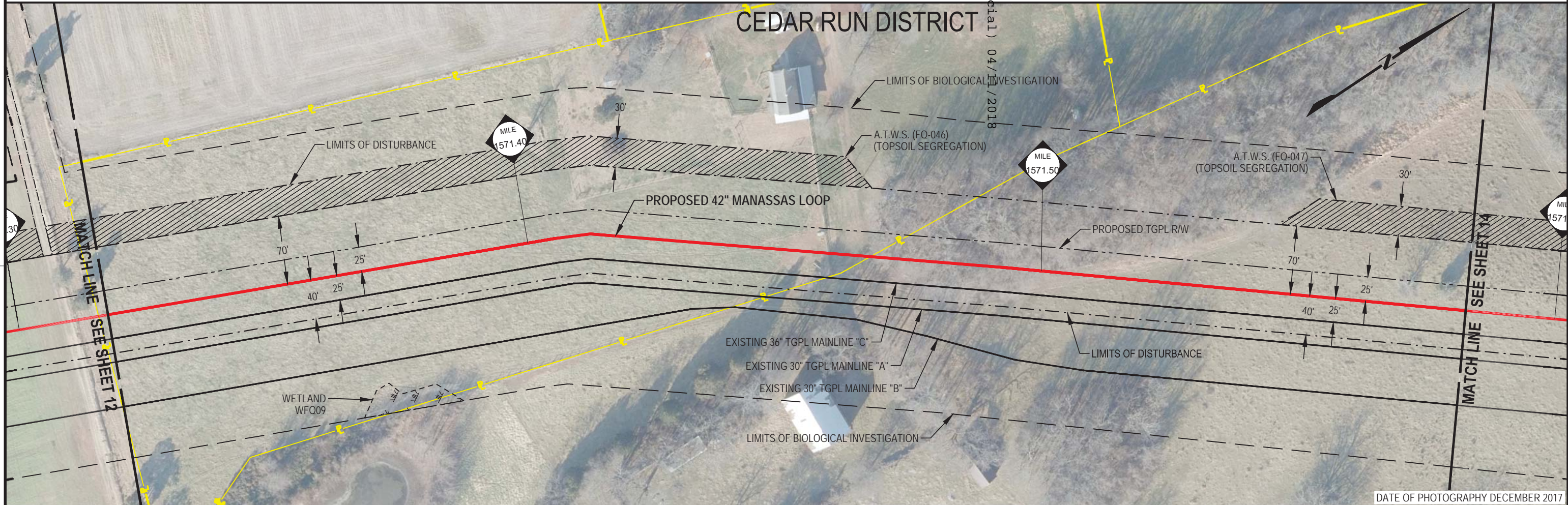
MILEPOSTS

M.P. 1571.40

M.P. 1571.50

20180411-5132 FERC PDF (Unofficial) 04/18/2018

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-035.000
7922-89-2275-000

VA-FA-033.000
7932-08-7642-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- P — PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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							WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 3:30pm LAND: 02/26/18 ENV: 02/26/18	3/27/2018	Mark Ho	OF 39

MILEPOSTS

M.P. 1571.60

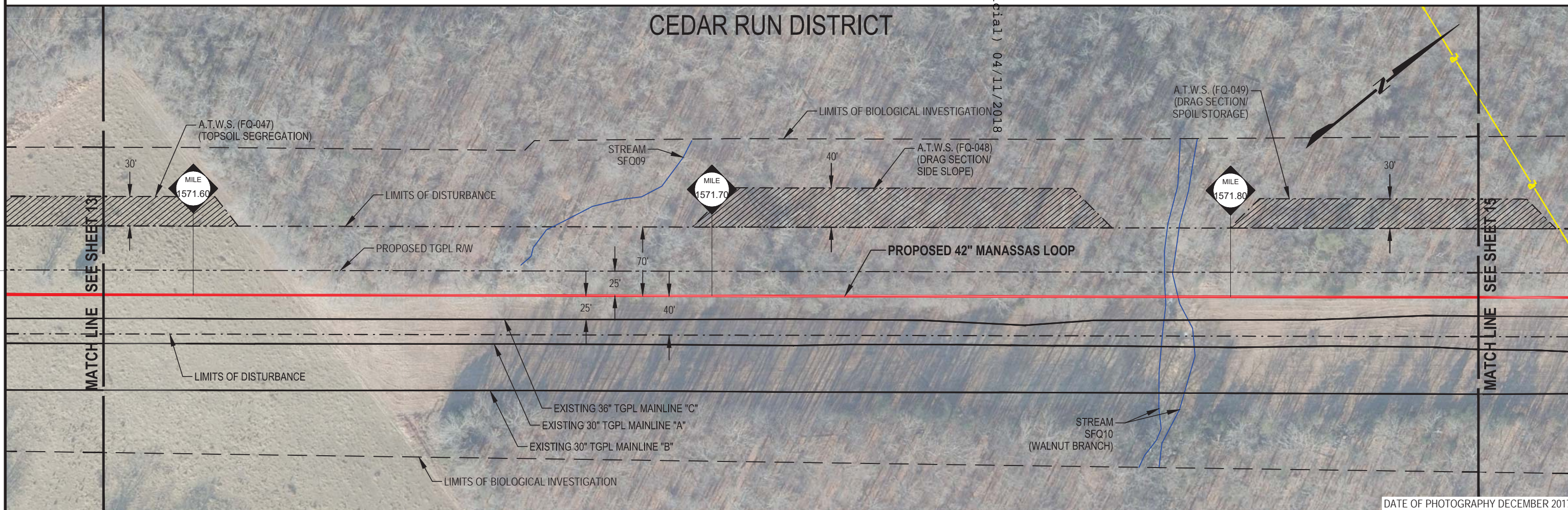
M.P. 1571.70

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1571.78 ENTER OHWM STREAM (SFQ10)
WALNUT BRANCH
M.P. 1571.79 EXIT OHWM STREAM (SFQ10)
WALNUT BRANCH

M.P. 1571.80

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-033.000
7932-08-7642-000



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- LIMITS OF DISTURBANCE
- PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION							W.O. NO.	CHK.
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0	
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MILEPOSTS

M.P. 1571.90

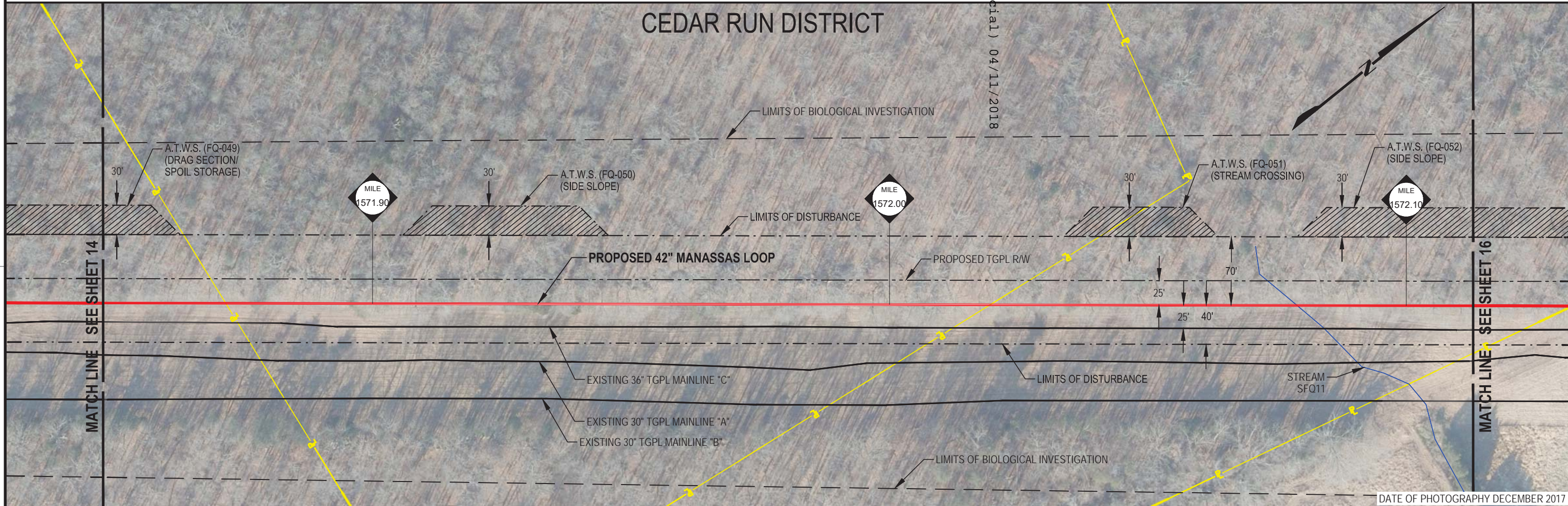
M.P. 1572.00

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1572.07 & STREAM (SFQ11)

M.P. 1572.10

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-033.000 7932-08-7642-000	VA-FA-038.000 7923-80-9747-000	VA-FA-040.000 7933-00-5937-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.	REFERENCE TITLE

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 15
WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3:32pm K:\MAPPING\VA\MAIN\LOOP\1568_17\FERC\FERC\Align\1568_17_Sht 11-20.dwg	OF 39

MILEPOSTS

M.P. 1572.15 PRIVATE ROAD

M.P. 1572.17 STREAM (SFQ12)

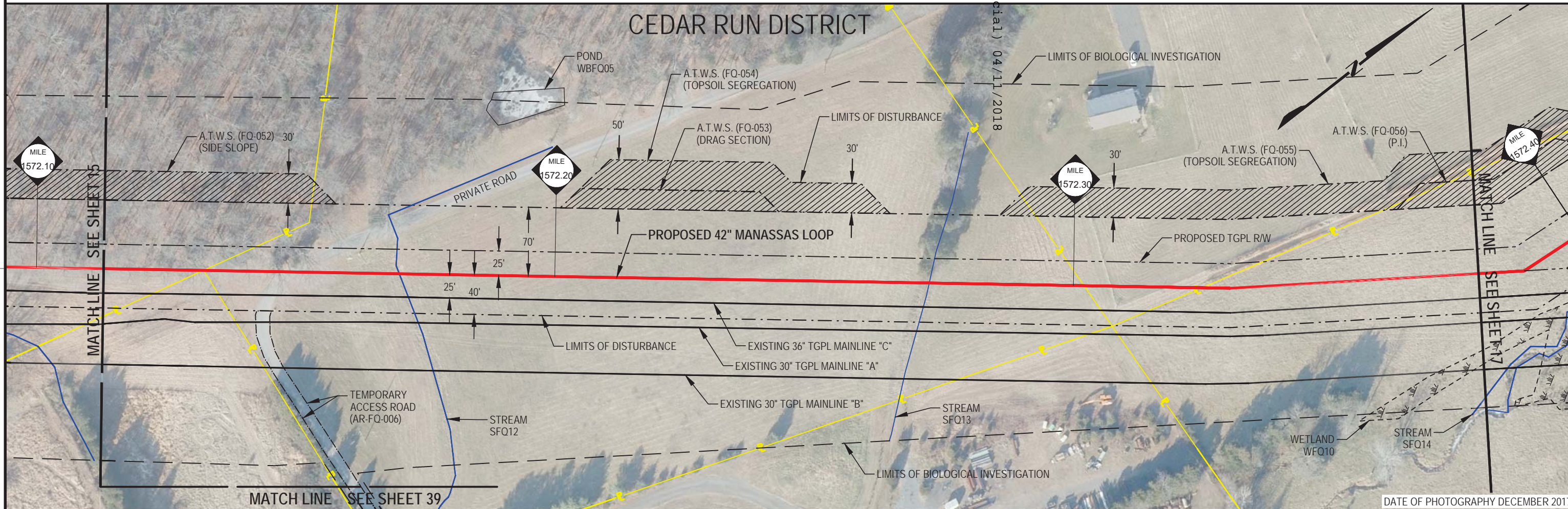
M.P. 1572.20

M.P. 1572.27 STREAM (SFQ13)

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1572.30

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-040.000 7933-00-5937-000	VA-FA-037.000 7933-10-2587-000	VA-FA-041.000 7933-01-3885-000	VA-FA-043.000 7933-02-5437-000	VA-FA-042.000 7933-11-8901-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

**WOOD GROUP
USA, INC.**

0 100 200 300
SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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							WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/28/2018	Mark Ho	OF 39

MILEPOSTS

M.P. 1572.40

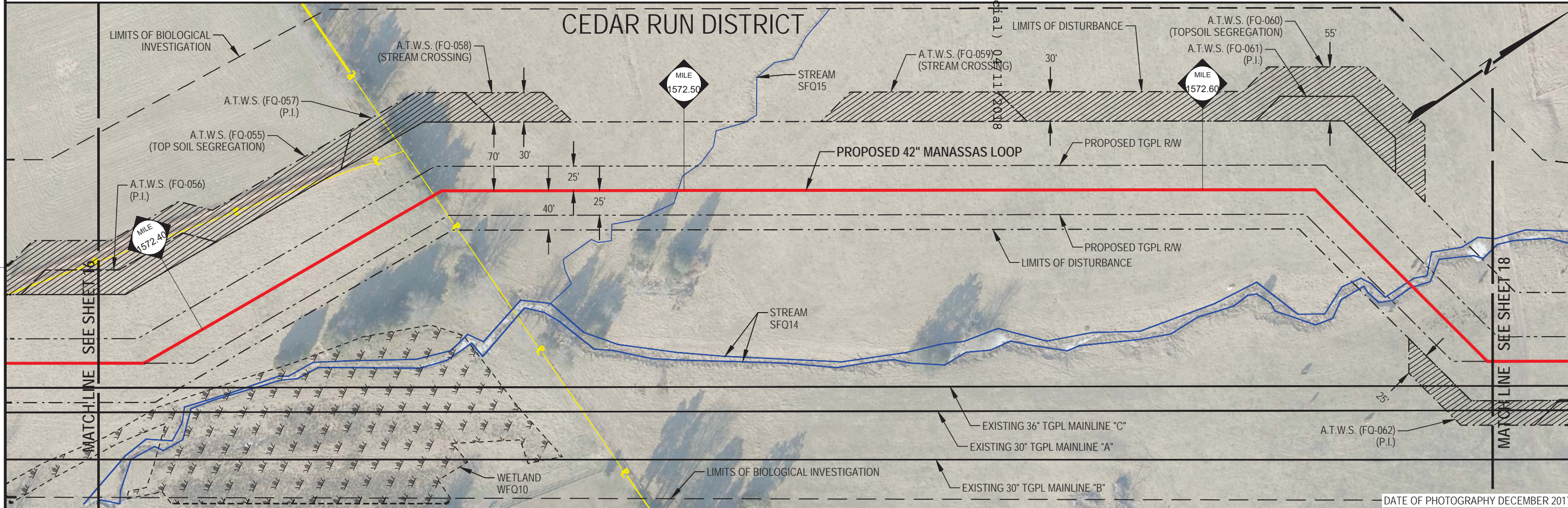
M.P. 1572.49 & STREAM (SFQ15)
M.P. 1572.50

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1572.60

M.P. 1572.64 ENTER OHWM STREAM (SFQ14)
M.P. 1572.65 EXIT OHWM STREAM (SFQ14)

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-042.000
7933-11-8901-000

VA-FA-044.000
7933-23-3449-000



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- P — PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE
0	ISSUED FOR FERC FILING

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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MILEPOSTS

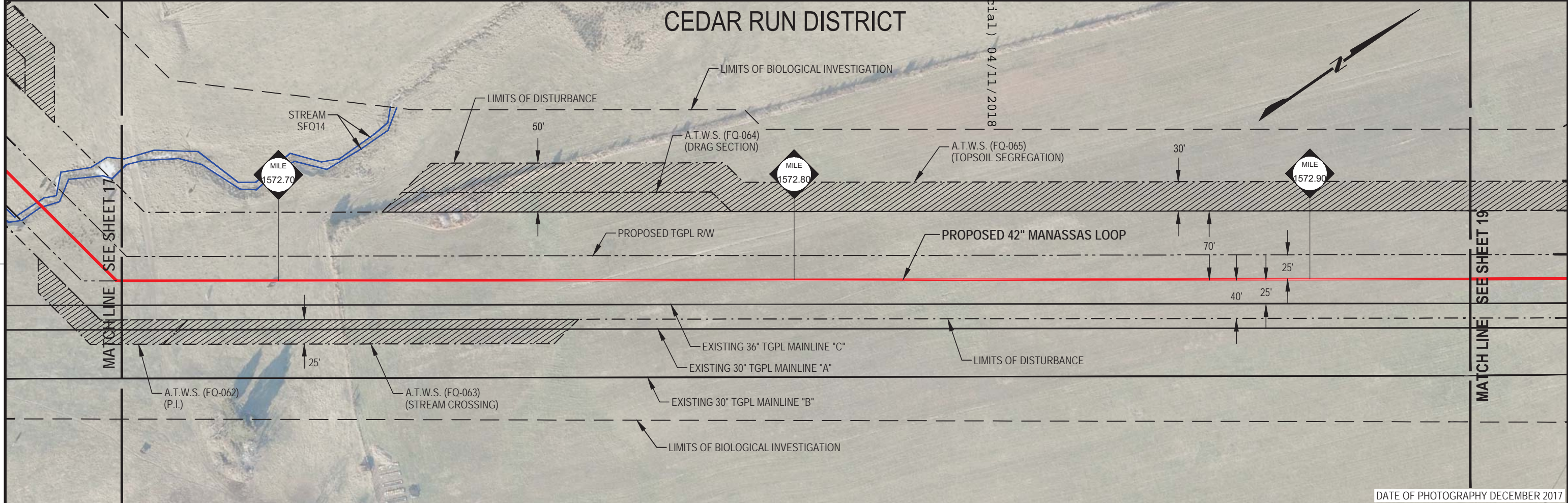
M.P. 1572.70

M.P. 1572.80

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1572.90

CEDAR RUN DISTRICT



OWNERSHIP

VA-FA-044.000
7933-23-3449-000

DATE OF PHOTOGRAPHY DECEMBER 2017



**WOOD GROUP
USA, INC.**

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- / / / ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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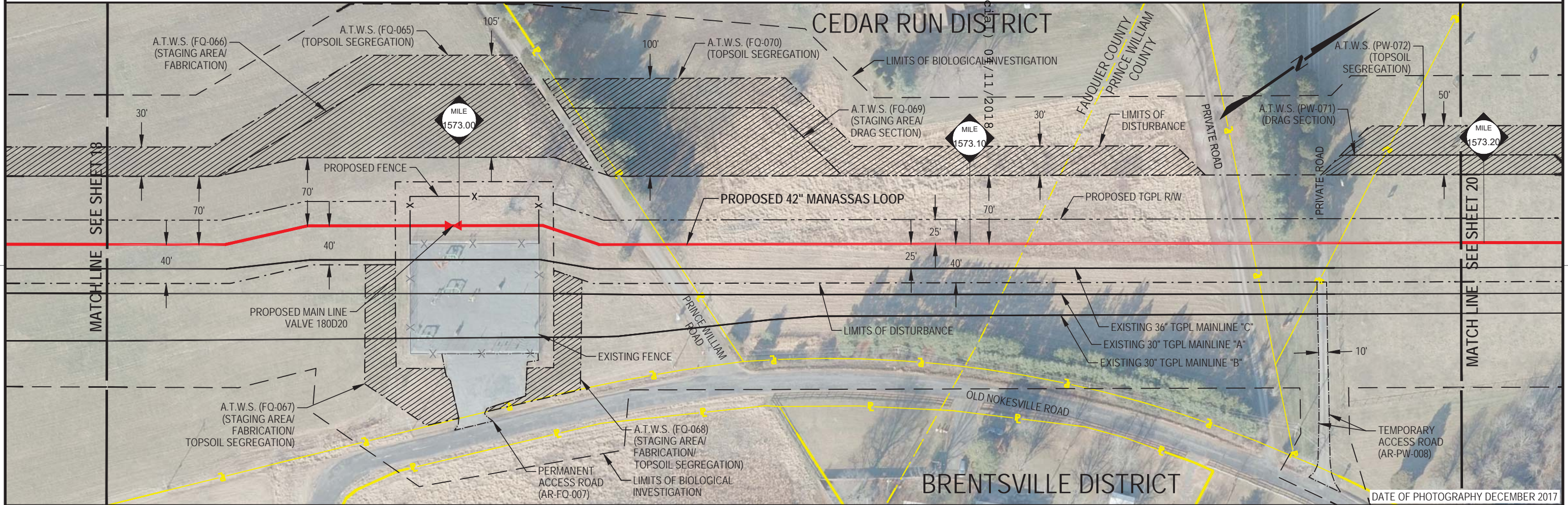
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA



DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 18
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MILEPOSTS

M.P. 1572.99 PROPOSED FENCE
 M.P. 1573.00 PROPOSED MAIN LINE VALVE 180D20
 M.P. 1573.00
 M.P. 1573.02 PROPOSED FENCE
 M.P. 1573.04 PRINCE WILLIAM ROAD
 20180411-5132 FEREC PDF (Unofficial) 07/11/2018
 M.P. 1573.10
 M.P. 1573.11 COUNTY LINE
 M.P. 1573.15 PRIVATE ROAD
 M.P. 1573.17 PRIVATE ROAD



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-044.000 7933-23-3449-000	PRINCE WILLIAM ROAD VA-FA-044.5.RD.	VA-FA-047.000 7933-35-5120-000	VA-FA-049.000 7933-35-2568-000	VA-PR-048.000 7393-45-2871
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

WOOD GROUP USA, INC.

SCALE IN FEET

DRAWING NO.	REFERENCE TITLE	TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85									
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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							WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/28/2018	Mark Ho	OF 39

MILEPOSTS

M.P. 1573.20

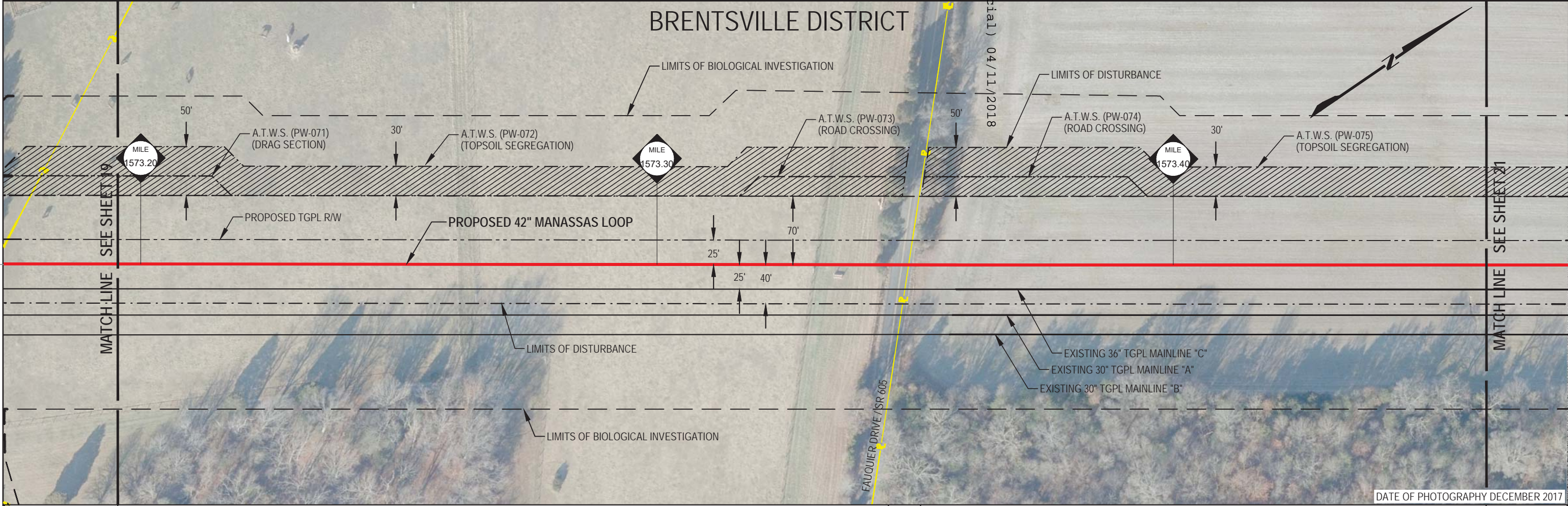
M.P. 1573.30

M.P. 1573.35 FAUQUIER DRIVE / SR 605

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1573.40

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-PR-048.000
7393-45-2871

FAUQUIER DRIVE /
SR 605
VA-PR-048.5.RD

VA-PR-050.000
7393-56-1269



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - - - LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - - - LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE				
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC

FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
PRINCE WILLIAM COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 20
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MILEPOSTS

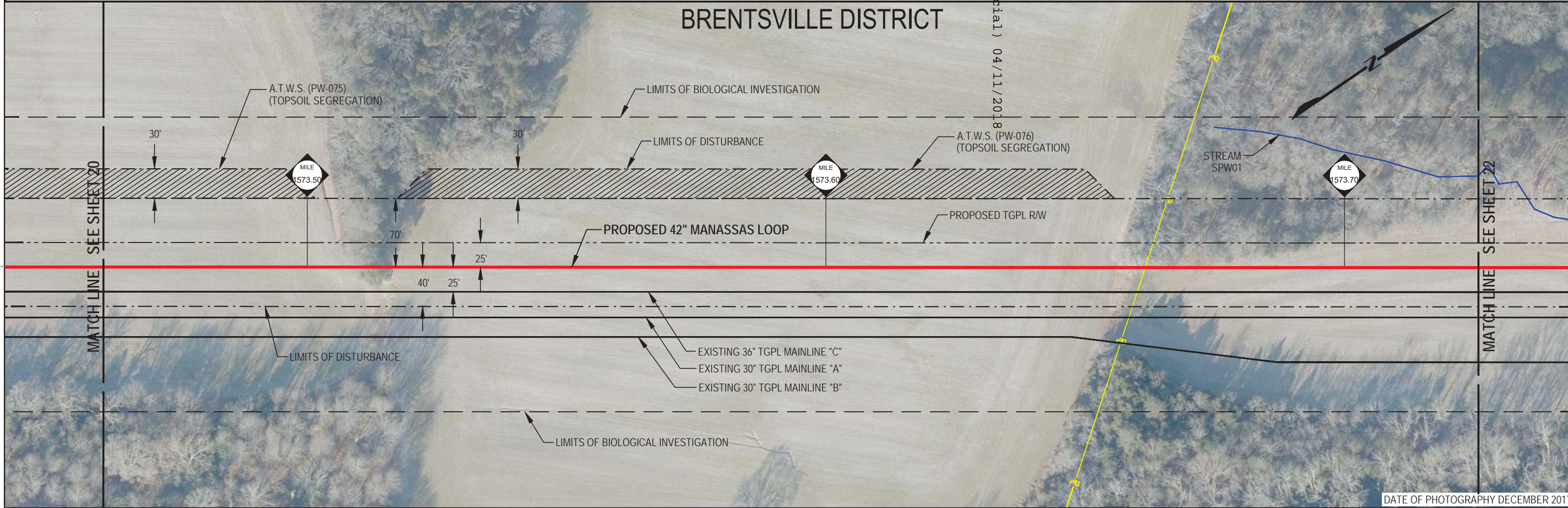
M.P. 1573.50

M.P. 1573.60

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1573.70

BRENTSVILLE DISTRICT




DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-PR-050.000 7393-56-1269	VA-PR-052.000 7393-67-7876
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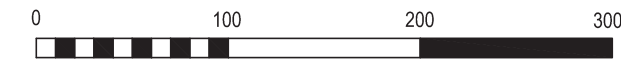
LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)


- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



**WOOD GROUP
USA, INC.**



SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		<p>TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 PPRINCE WILLIAM COUNTY, VIRGINIA</p> 							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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MILEPOSTS

M.P. 1573.80

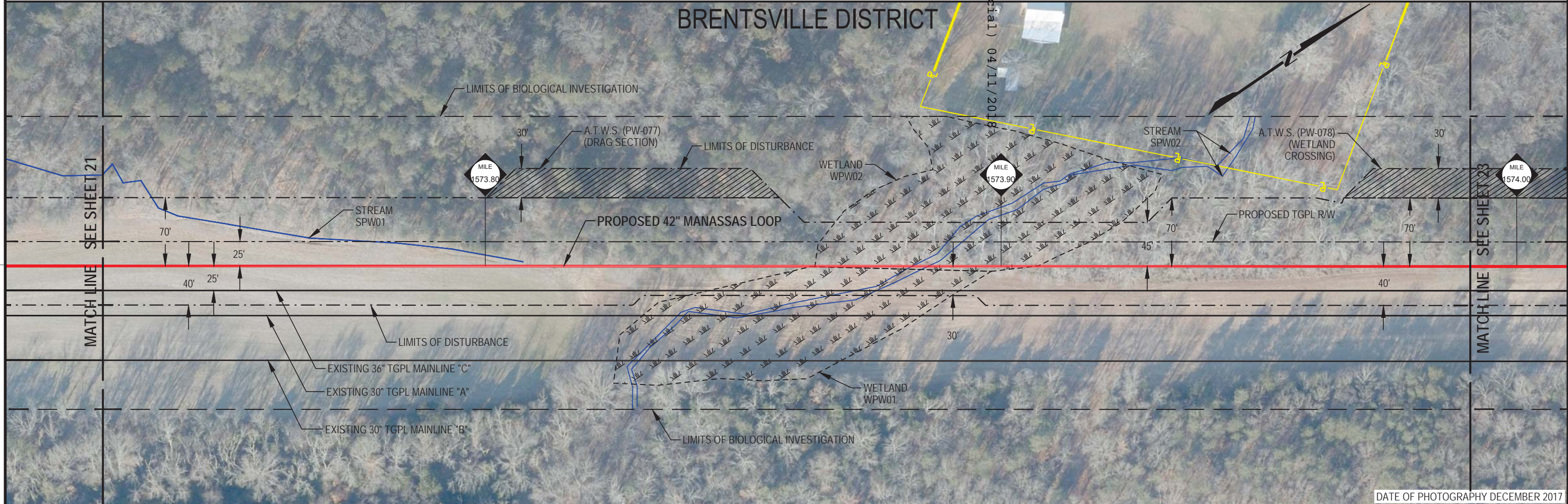
M.P. 1573.86 ENTER WETLAND (WPW02)

M.P. 1573.88 EXIT WETLAND (WPW02),
ENTER OHWM STREAM (SPW02),
M.P. 1573.88 EXIT OHWM STREAM (SPW02),
ENTER WETLAND (WPW02)

20180411-5132 FERRC PDF (06/28/2018) 04/11/2018

M.P. 1573.90 EXIT WETLAND (WPW02)

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-PR-052.000
7393-67-7876



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 PRINCE WILLIAM COUNTY, VIRGINIA						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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						APPROVED BY: MJH		DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 22 OF 39
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MILEPOSTS

M.P. 1574.00

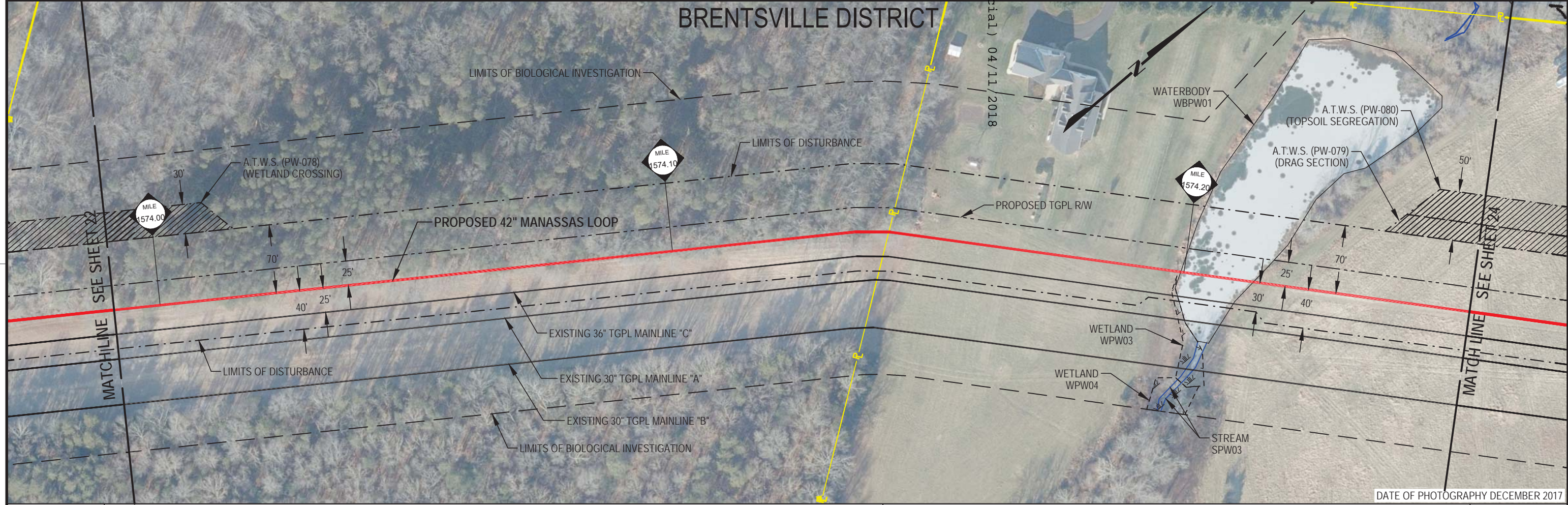
M.P. 1574.10

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1574.19 ENTER WATERBODY (WBPW01)
M.P. 1574.20

M.P. 1574.21 EXIT WATERBODY (WBPW01)

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-PR-052.000
7393-67-7876

VA-PR-054.000
7393-79-2458



LEGEND	
	PROPOSED 42" MANASSAS LOOP
	EXISTING PIPELINES
	EXISTING TGPL RW
	LIMITS OF DISTURBANCE
	PROPOSED TGPL RW
	PROPERTY LINE
	STREAM CROSSING
	WETLAND AREA
	ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
	PROPOSED FENCE
	EXISTING FENCE
	FIBER OPTIC CABLE
	LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
PRINCE WILLIAM COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 23
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MILEPOSTS

M.P. 1574.29 PRIVATE ROAD

M.P. 1574.30

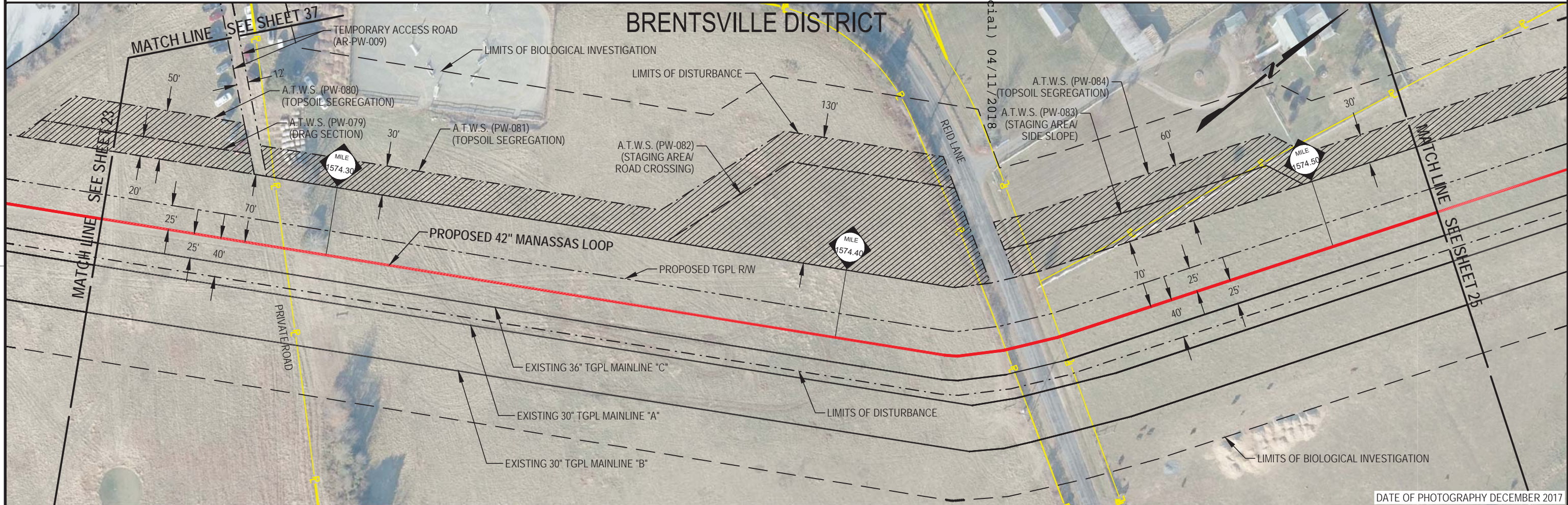
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20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1574.44 REID LANE

M.P. 1574.50

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-PR-054.000 7393-79-2458	VA-PR-055.000 7394-70-8329	REID LANE VA-PR-055.5.RD	VA-PR-059.000 7394-81-4114
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- - - WETLAND AREA
- - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 PRINCE WILLIAM COUNTY, VIRGINIA						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

M.P. 1574.60

M.P. 1574.63 ENTER OHWM STREAM (SPW05)
M.P. 1574.63 EXIT OHWM STREAM (SPW05)

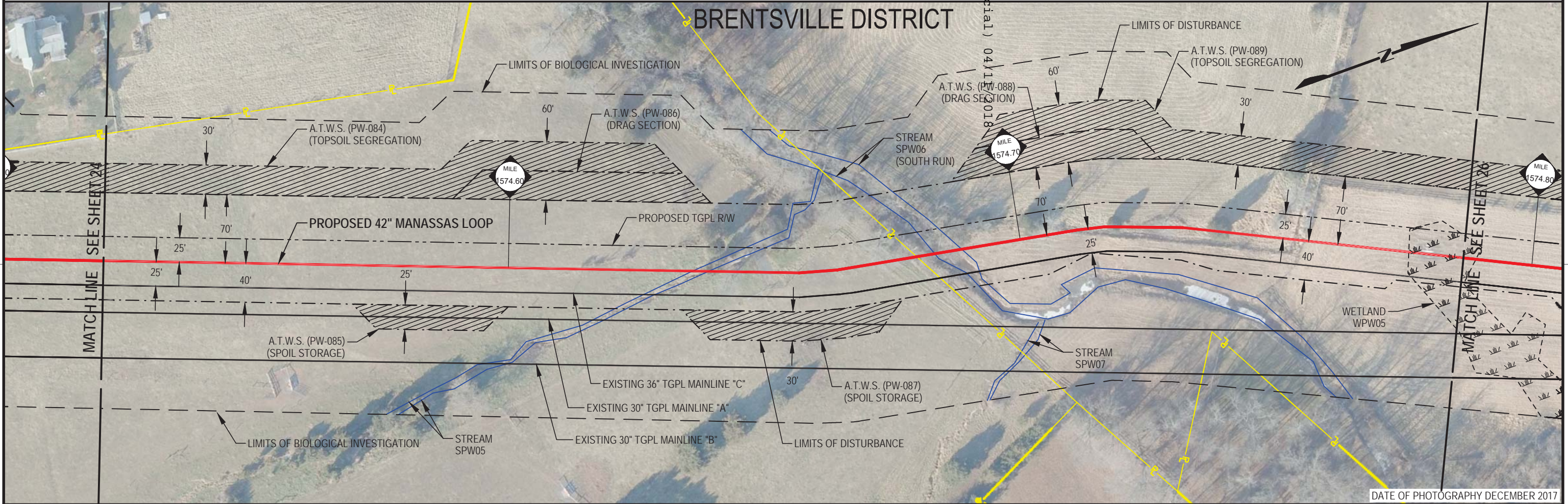
M.P. 1574.68 ENTER OHWM STREAM (SPW06)

M.P. 1574.69 EXIT OHWM STREAM (SPW06)

20180411-5132 FERC PDF (Unofficial) 04/11/2018
M.P. 1574.70

M.P. 1574.78 ENTER WETLAND (WPW05)

BRENTSVILLE DISTRICT



OWNERSHIP

VA-PR-059.000
7394-81-4114

VA-PR-062.000
7394-72-8741

DATE OF PHOTOGRAPHY DECEMBER 2017



- LEGEND**
- PROPOSED 42" MANASSAS LOOP
 - EXISTING PIPELINES
 - EXISTING TGPL R/W
 - - - - LIMITS OF DISTURBANCE
 - - - - PROPOSED TGPL R/W
 - PROPERTY LINE
 - STREAM CROSSING
 - - - - LIMITS OF BIOLOGICAL INVESTIGATION
 - - - - PROPOSED FENCE
 - - - - EXISTING FENCE
 - C — FIBER OPTIC CABLE
 - - - - LIMITS OF DISTURBANCE
 - - - - WETLAND AREA
 - - - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
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TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
PRINCE WILLIAM COUNTY, VIRGINIA

Williams

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

M.P. 1574.78 EXIT WETLAND (WPW05)

M.P. 1574.80

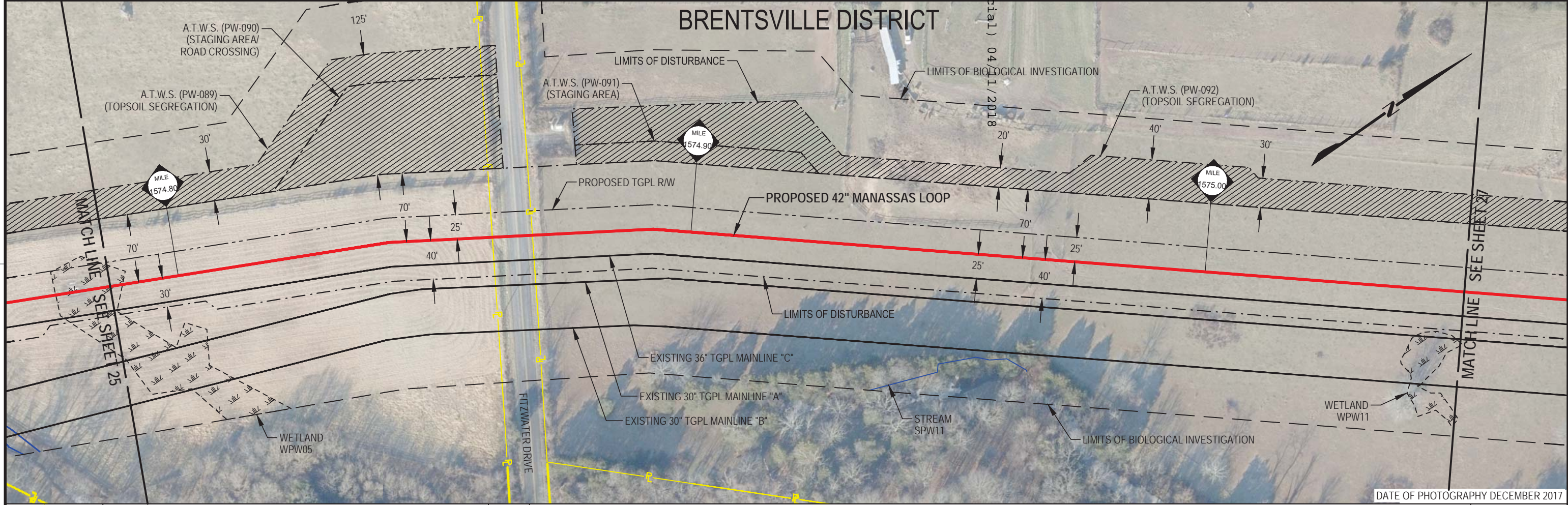
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M.P. 1574.90

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1575.00

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-PR-062.000
7394-72-8741

FITZWATER DRIVE
VA-PR-062.5.RD

VA-PR-064.000
7394-93-4555

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- LIMITS OF DISTURBANCE
- PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
PRINCE WILLIAM COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 26
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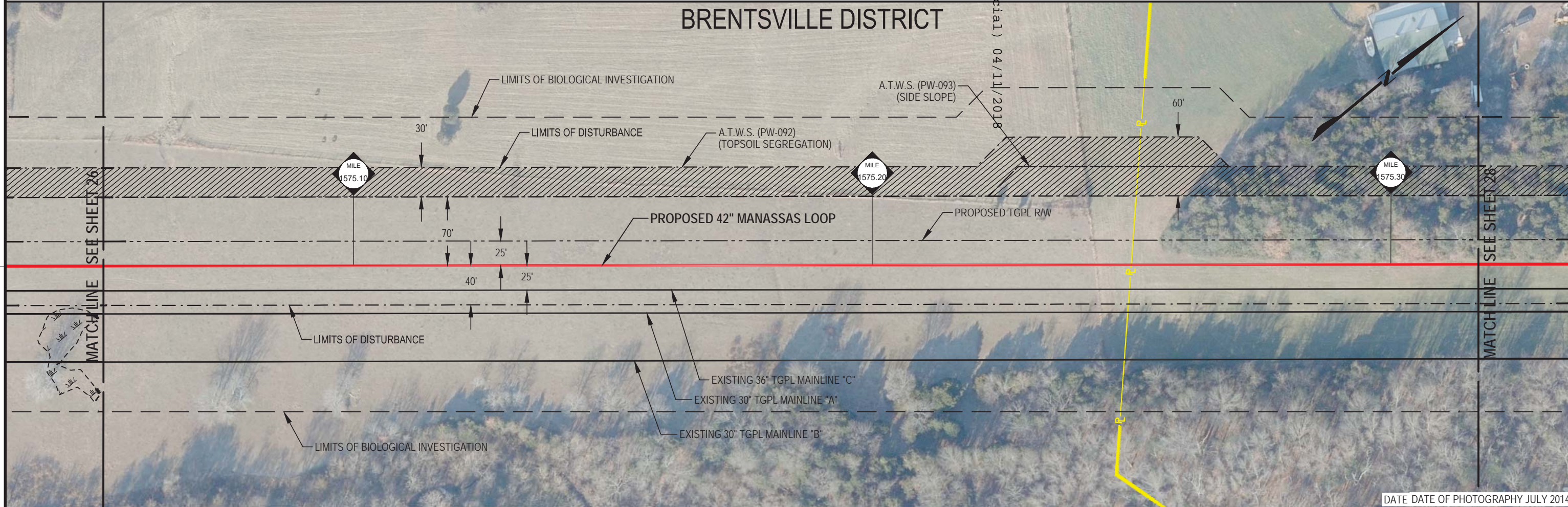
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M.P. 1575.20

20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1575.30

BRENTSVILLE DISTRICT



DATE DATE OF PHOTOGRAPHY JULY 2014

OWNERSHIP

VA-PR-064.000
7394-93-4555

VA-PR-064.100
7494-04-4759



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- P — PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 PRINCE WILLIAM COUNTY, VIRGINIA						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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MILEPOSTS

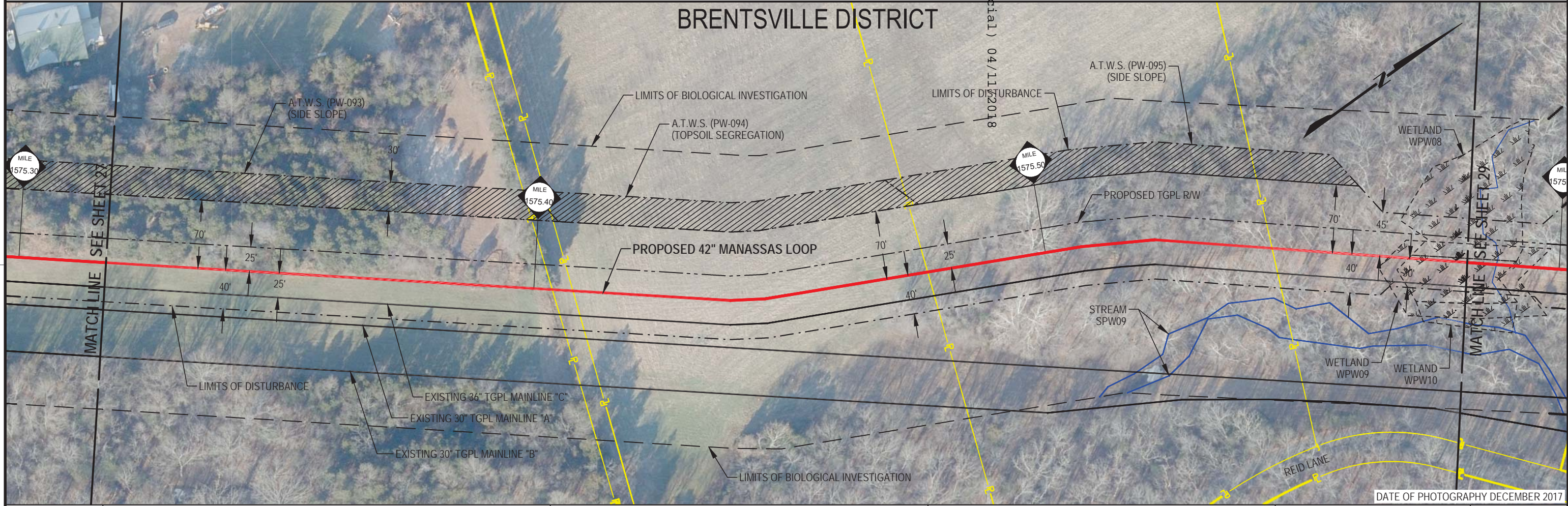
20180411-5132 FERC PDF (Unofficial) 04/11/2018

M.P. 1575.40

M.P. 1575.50

M.P. 1575.57 ENTER WETLAND (WPW09)

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-PR-064.100 7494-04-4759	VA-PR-067.000 7494-05-7304	VA-PR-067.100 7494-05-6146	VA-PR-067.200 7494-05-6981
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- - - X - - - PROPOSED FENCE
- - - X - - - EXISTING FENCE
- - - C - - - FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION
- - - WETLAND AREA
- - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

**WOOD GROUP
USA, INC.**

0 100 200 300
SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 PRINCE WILLIAM COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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							APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 28	
							WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/27/2018 1:02pm	Tuan.L2	OF 39

MILEPOSTS

M.P. 1575.58 ϵ STREAM (SPW10)
 M.P. 1575.59 ϵ EXIT WETLAND (WPW09)
 M.P. 1575.60

M.P. 1575.69 ϵ REID LANE
 M.P. 1575.70

M.P. 1575.71 EXISTING FOREIGN PIPELINE CROSSING
 M.P. 1575.72 OVERHEAD ELECTRIC

20180411-5132 FERC PDF (Unofficial) 04/11/2018
 M.P. 1575.74 OVERHEAD ELECTRIC

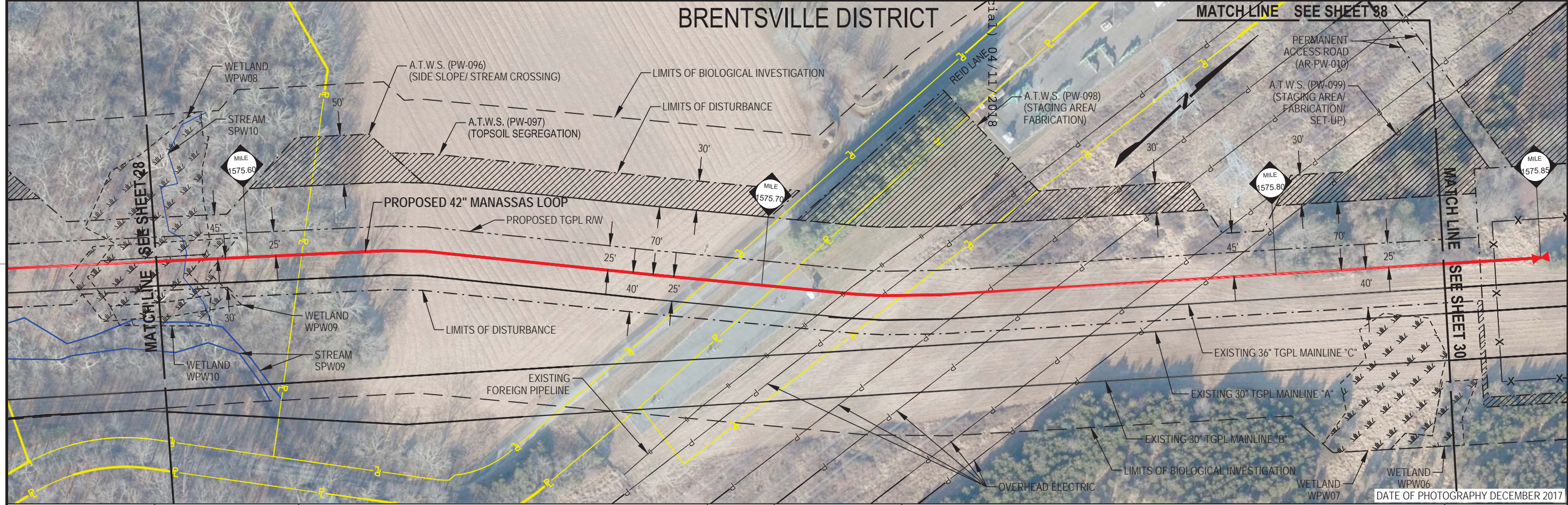
M.P. 1575.75 OVERHEAD ELECTRIC

M.P. 1575.77 OVERHEAD ELECTRIC

M.P. 1575.79 OVERHEAD ELECTRIC

M.P. 1575.80

BRENTSVILLE DISTRICT



OWNERSHIP

VA-PR-067.000
7494-05-6981

VA-PR-069.000
7494-06-7868

REID LANE
VA-PR-069.5.RD

VA-PR-068.000
7494-16-6320

VA-PR-070.000
7494-26-3796

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- LIMITS OF DISTURBANCE
- PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE
0	ISSUED FOR FERC FILING

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 FERC ALIGNMENT SHEET
 SOUTHEASTERN TRAIL PROJECT
 PROPOSED 42" MANASSAS LOOP
 FROM M.P. 1568.13 TO M.P. 1575.85
 PRINCE WILLIAM COUNTY, VIRGINIA

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NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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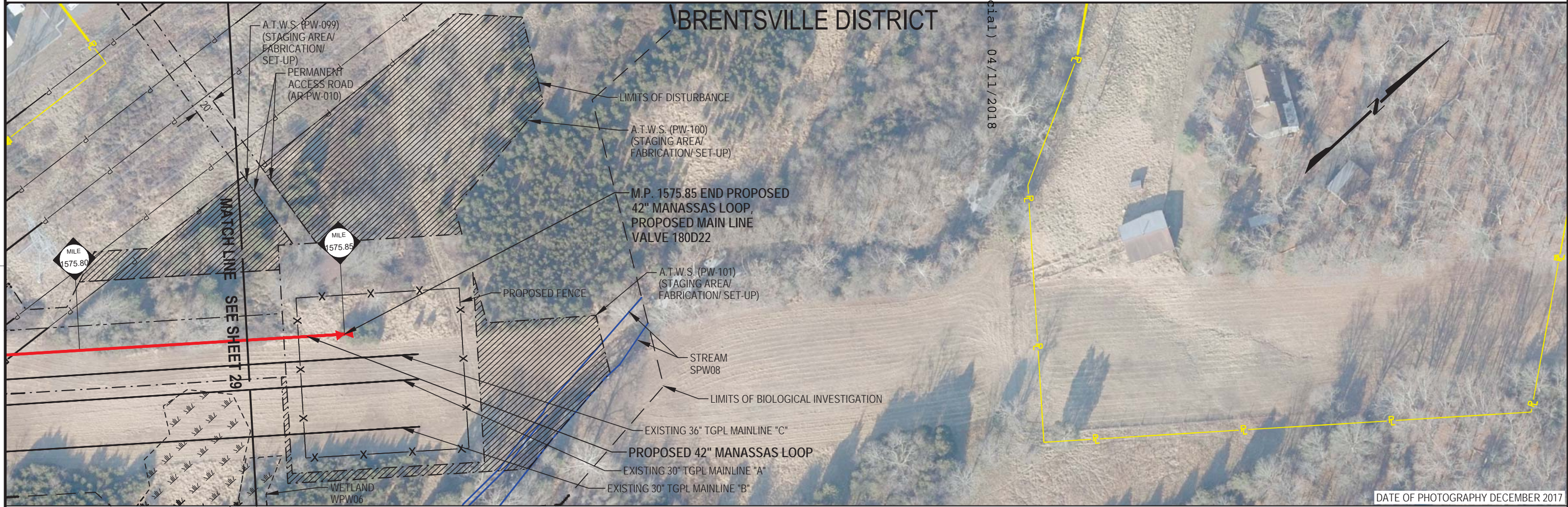
DATE OF PHOTOGRAPHY DECEMBER 2017

MILEPOSTS

M.P. 1575.84 PROPOSED FENCE

M.P. 1575.85 PROPOSED MAIN LINE VALVE 180D22,
END PROPOSED 42" MANASSAS LOOP

20180411-5132 FERC PDF (Unofficial) 04/11/2018



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-PR-070.000
7494-26-3796



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL RW
- LIMITS OF DISTURBANCE
- PROPOSED TGPL RW
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION

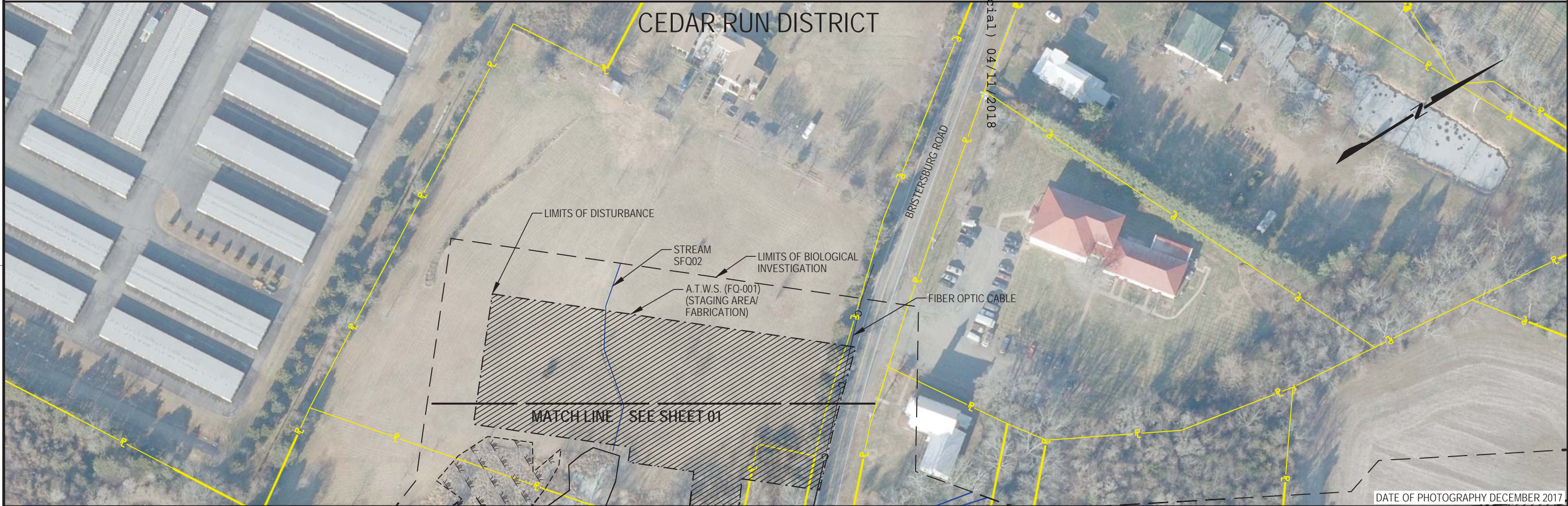


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NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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						APPROVED BY: MJH		DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	
						WO: 1199779		ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/27/2018 1:05pm Tuon.Lc2 OF 39	

MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

VA-FA-005.000
7921-03-2311-000

BRISTERSBURG ROAD
VA-FA-002.5.RD



LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- - - WETLAND AREA
- - - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION



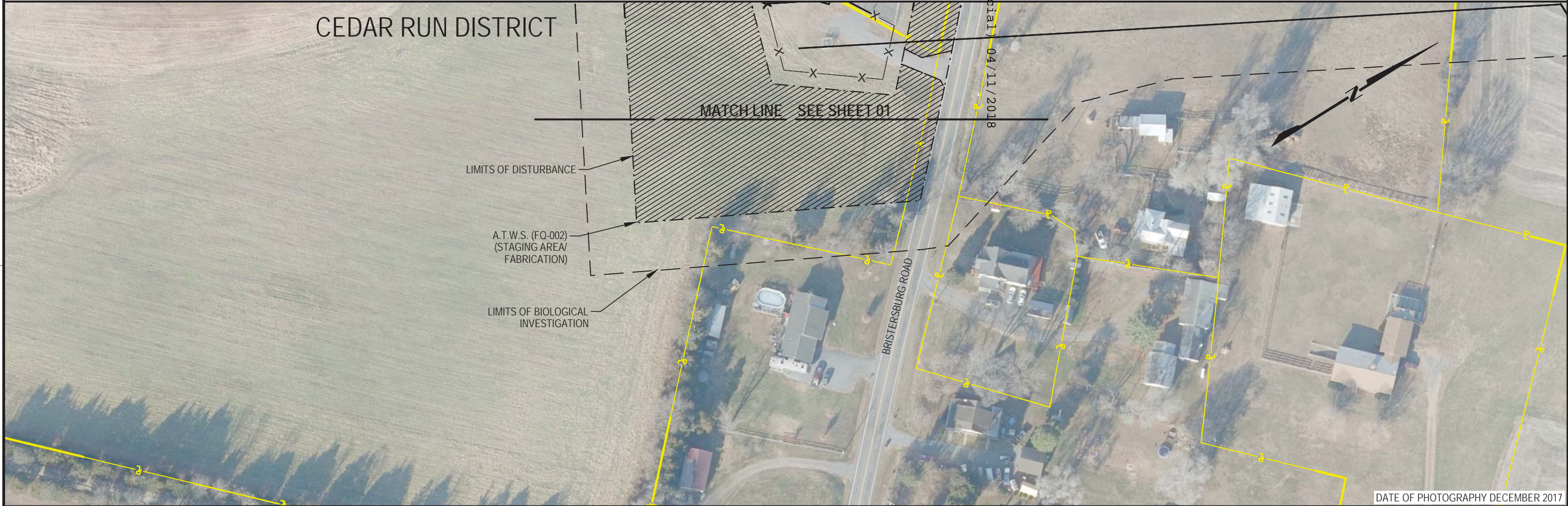
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NO.	DATE	BY	REVISION DESCRIPTION
0	04/04/18	MH	ISSUED FOR FERC FILING

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 31 OF 39
WO: 1199779	ROUTE ID: 101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	1:06pm 3/27/2018	Mark.Ho

MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-FA-001.000 7911-91-5768-000	BRISTERSBURG ROAD VA-FA-002.5.RD
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

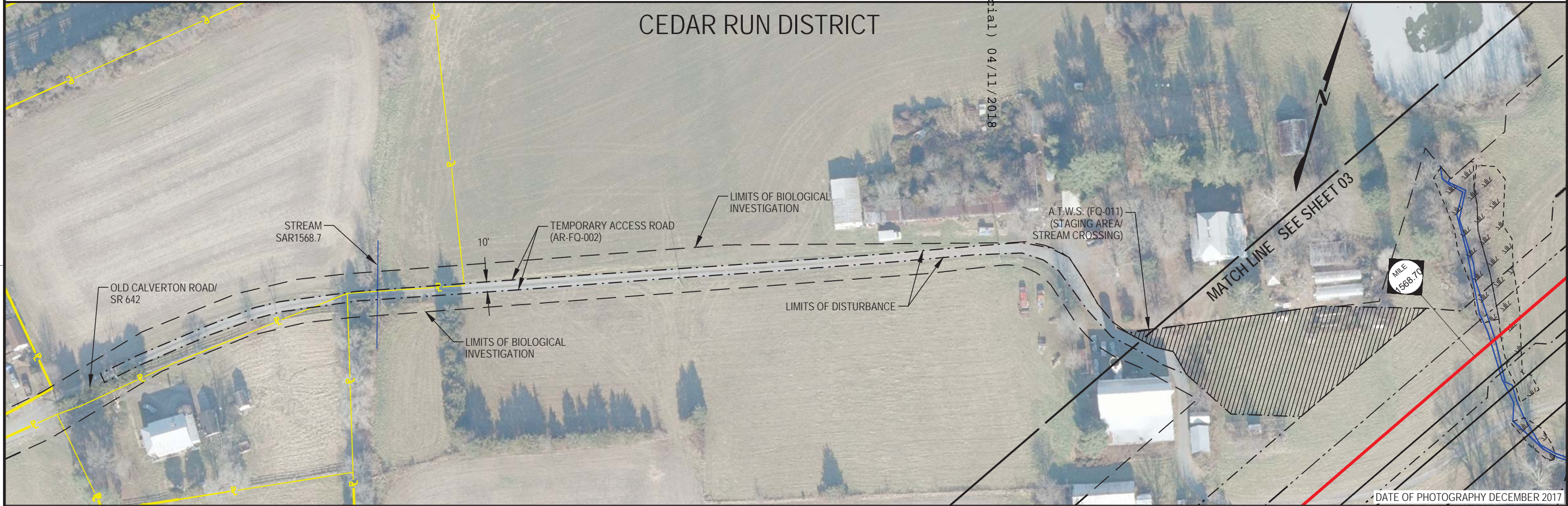
SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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							APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 32
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018

CEDAR RUN DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	UNKNOWN	VA-FA-017.000TAR2 7921-05-8185-000	VA-FA-017.000 7921-25-4803-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION

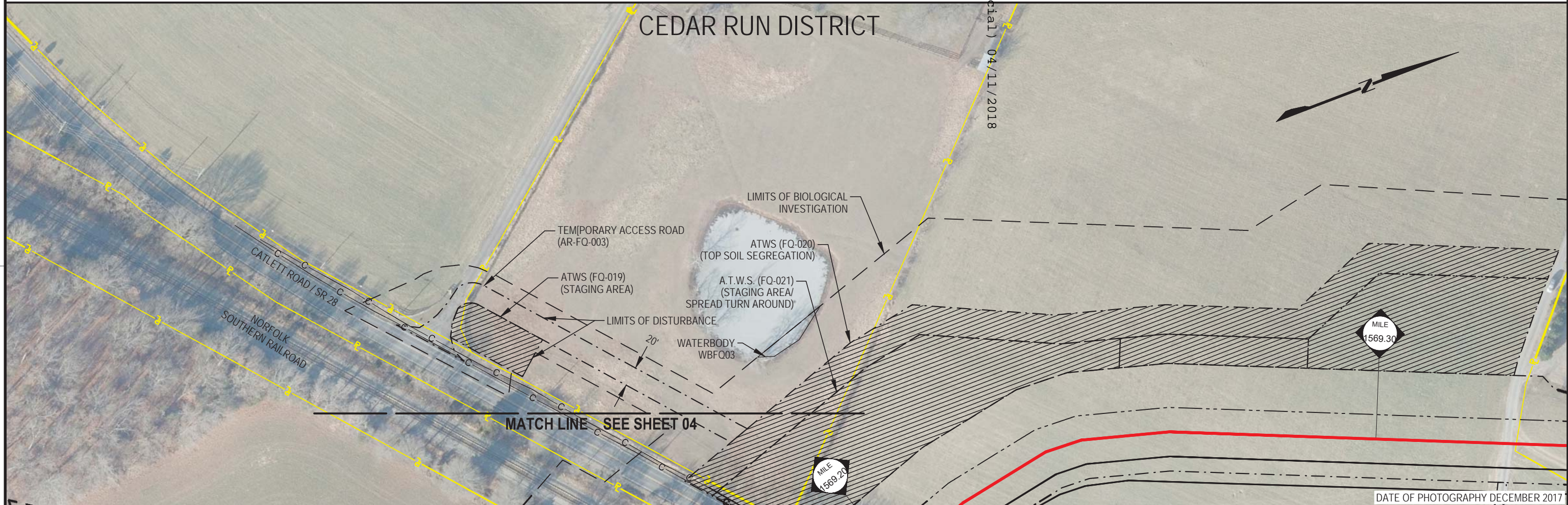
WOOD GROUP USA, INC.

SCALE IN FEET

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018



OWNERSHIP	CATLETT ROAD / SR 28 VA-FA-018.5.RD	VA-FA-020.000TAR2 7921-17-9515-000	VA-FA-020.000 7921-27-6968-000
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LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - LIMITS OF DISTURBANCE
- - - PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

**WOOD GROUP
USA, INC.**

- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - LIMITS OF BIOLOGICAL INVESTIGATION

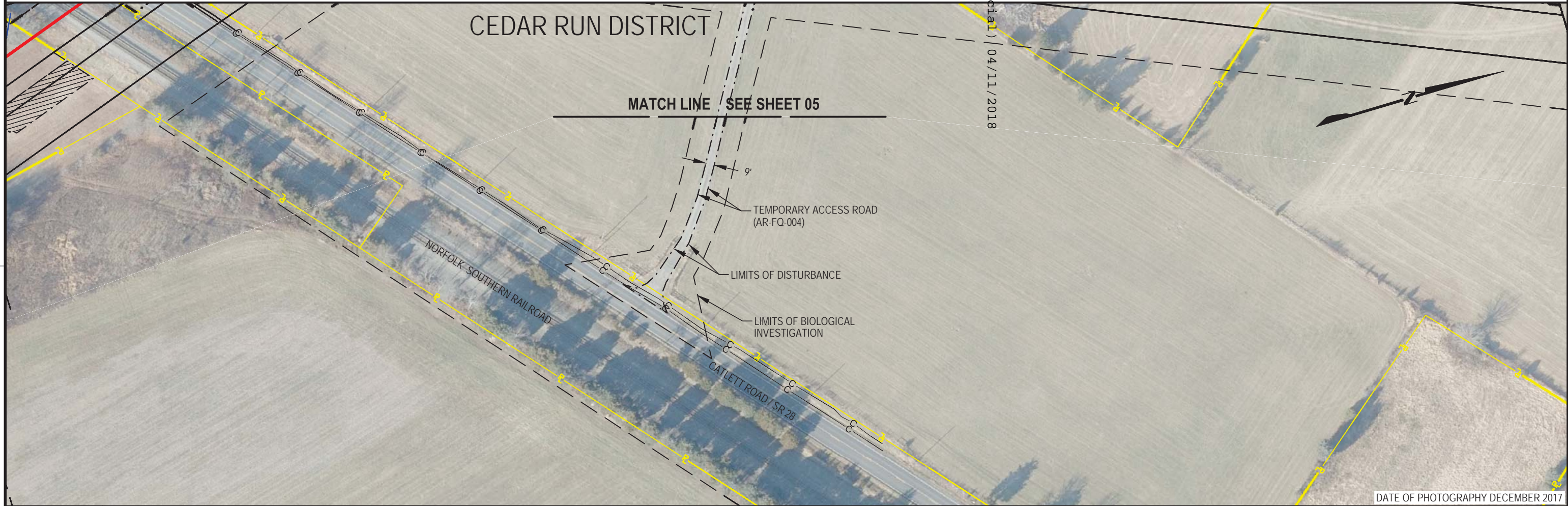
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DRAWING NO.	REFERENCE TITLE	TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC FERC ALIGNMENT SHEET SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FROM M.P. 1568.13 TO M.P. 1575.85 FAUQUIER COUNTY, VIRGINIA									
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0	
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DATE OF PHOTOGRAPHY DECEMBER 2017

MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018



OWNERSHIP

CATLETT ROAD / SR 28
VA-FA-018.5.RD

VA-FA-022.000
7921-29-0530-000

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- - - - - LIMITS OF DISTURBANCE
- - - - - PROPOSED TGPL R/W
- P — PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
- X — PROPOSED FENCE
- X — EXISTING FENCE
- C — FIBER OPTIC CABLE
- - - - - LIMITS OF BIOLOGICAL INVESTIGATION



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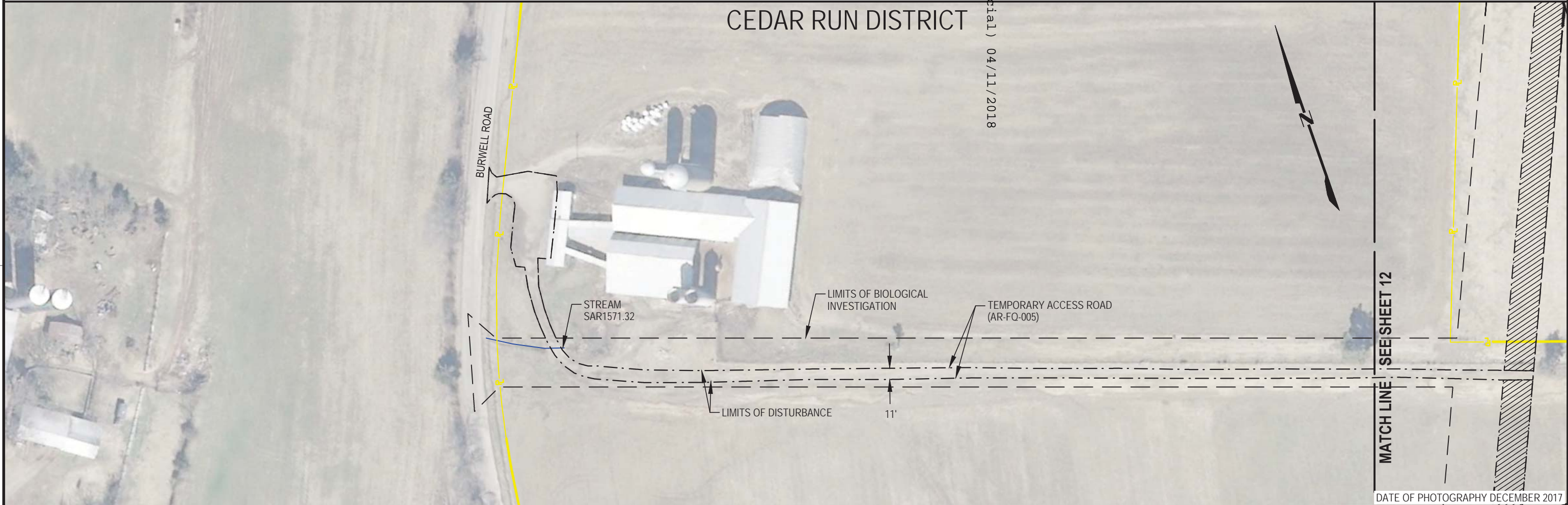
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'	
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0	
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018

CEDAR RUN DISTRICT



OWNERSHIP

BURWELL ROAD

VA-FA-031.000
7922-77-9322-000

DATE OF PHOTOGRAPHY DECEMBER 2017

- LEGEND**
- PROPOSED 42" MANASSAS LOOP
 - EXISTING PIPELINES
 - EXISTING TGPL RW
 - LIMITS OF DISTURBANCE
 - PROPOSED TGPL RW
 - PROPERTY LINE
 - STREAM CROSSING
 - WETLAND AREA
 - ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)

- PROPOSED FENCE
- EXISTING FENCE
- FIBER OPTIC CABLE
- LIMITS OF BIOLOGICAL INVESTIGATION



DRAWING NO.	REFERENCE TITLE					
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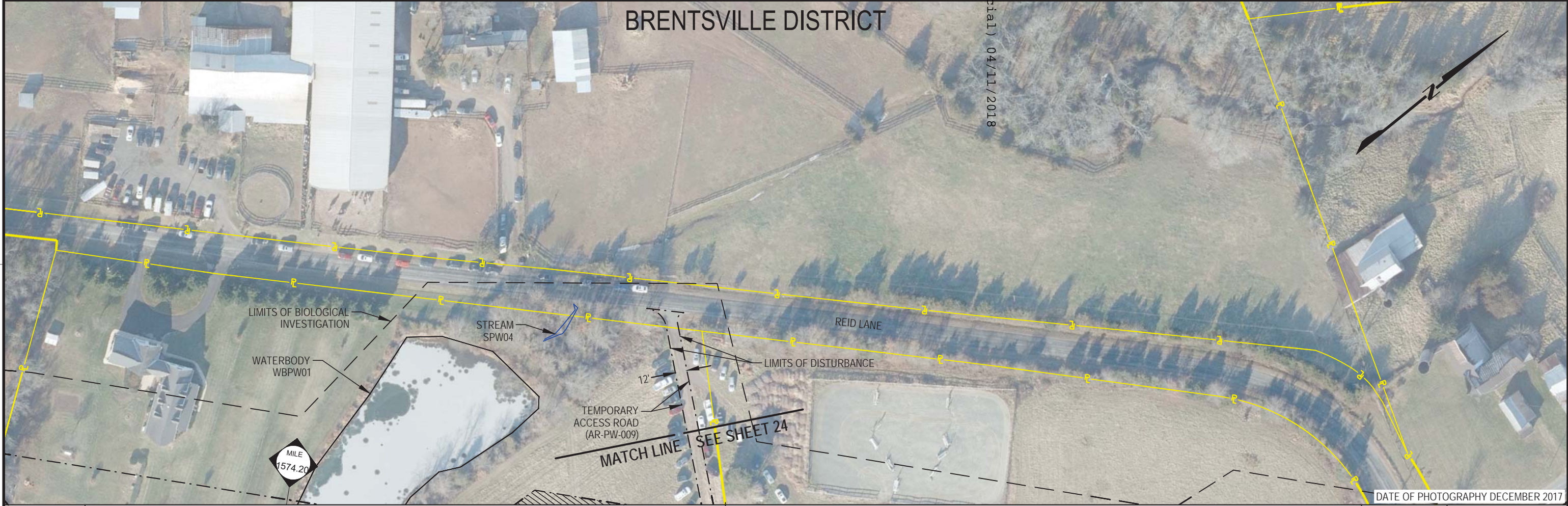
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 36
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP	VA-PR-054.000 7393-79-2458	VA-PR-055.000 7394-70-8329	REID LANE VA-PR-055.5.RD
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LEGEND

	PROPOSED 42" MANASSAS LOOP		PROPOSED FENCE
	EXISTING PIPELINES		EXISTING FENCE
	EXISTING TGPL RW		FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE		LIMITS OF BIOLOGICAL INVESTIGATION
	PROPOSED TGPL RW		
	PROPERTY LINE		
	STREAM CROSSING		
	WETLAND AREA		
	ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)		

SCALE IN FEET



DRAWING NO.	REFERENCE TITLE					
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	TL	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC

FERC ALIGNMENT SHEET
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
FROM M.P. 1568.13 TO M.P. 1575.85
PRINCE WILLIAM COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 37
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018

BRENTSVILLE DISTRICT



DATE OF PHOTOGRAPHY DECEMBER 2017

OWNERSHIP

REID LANE
VA-PR-069.5.RD

VA-PR-070.000
7494-26-3796

LEGEND

- PROPOSED 42" MANASSAS LOOP
- EXISTING PIPELINES
- EXISTING TGPL R/W
- LIMITS OF DISTURBANCE
- PROPOSED TGPL R/W
- PROPERTY LINE
- STREAM CROSSING
- WETLAND AREA
- ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)
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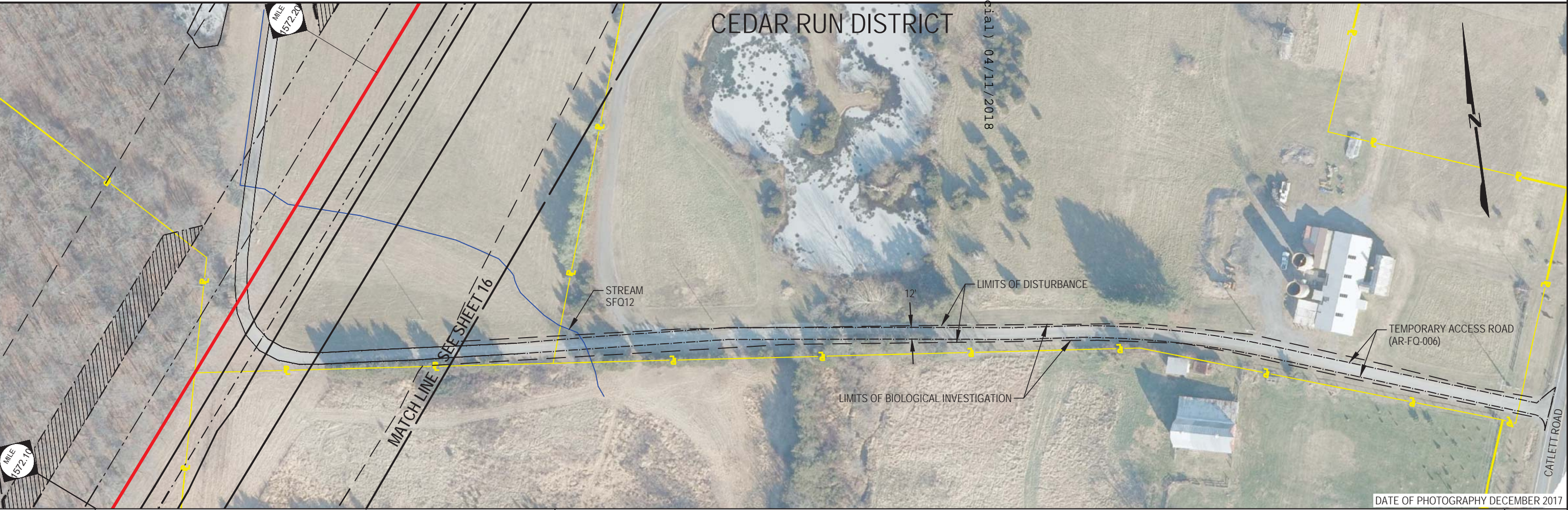
TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 FERC ALIGNMENT SHEET
 SOUTHEASTERN TRAIL PROJECTS
 PROJECT PROPOSED 42" MANASSAS
 FROM M.P. 1568.13 TO M.P. 1575.85
 PRINCE WILLIAM COUNTY, VIRGINIA



DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
CHECKED BY: W.	DATE: 09/21/17	ISSUED FOR CONSTRUCTION:	REVISION: 0
APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 38
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MILEPOSTS

20180411-5132 FERC PDF (Unofficial) 04/11/2018



OWNERSHIP	VA-FA-041.000 7933-01-3885-000	VA-FA-039.000 7933-11-7174-000	CATLETT ROAD / SR 28 VA-FA-018.5.RD

LEGEND

	PROPOSED 42" MANASSAS LOOP		PROPOSED FENCE
	EXISTING PIPELINES		EXISTING FENCE
	EXISTING TGPL RW		FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE		LIMITS OF BIOLOGICAL INVESTIGATION
	PROPOSED TGPL RW		
	PROPERTY LINE		
	STREAM CROSSING		
	WETLAND AREA		
	ADDITIONAL TEMPORARY WORKSPACE (A.T.W.S.)		

SCALE IN FEET



DRAWING NO.	REFERENCE TITLE
0	ISSUED FOR FERC FILING

NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.
0	04/04/18	MH	ISSUED FOR FERC FILING	1199779	W.	MJH

TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC
 FERC ALIGNMENT SHEET
 SOUTHEASTERN TRAIL PROJECT
 PROPOSED 42" MANASSAS LOOP
 FROM M.P. 1568.13 TO M.P. 1575.85
 FAUQUIER COUNTY, VIRGINIA

DRAWN BY: MH	DATE: 09/20/17	ISSUED FOR BID:	SCALE: 1" = 100'
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APPROVED BY: MJH	DATE: 09/22/17	DRAWING NUMBER: F-MANA-D-AS-01	SHEET 39
WO: 1199779	ROUTE ID:101 CIVIL: 02/26/18 LAND: 02/26/18 ENV: 02/26/18	3/27/2018	OF 39

APPENDIX C
OVERSIZE TABLES

Table 1

Co-location with Existing Corridors for the Southeastern Trail Project

Transco Mainline MP		County	Paralleled Length (miles)	Type of ROW ^a	Width Used for Temporary Construction ROW (feet) ^b	Width Used for Permanent ROW (feet) ^b	Road/Utility Description
Begin	End						
Southern / Manassas Loop							
1568.2	1568.3	Fauquier	0.1	Pipeline	40	25	Transco Mainline
1568.3	1568.4	Fauquier	0.1	Pipeline	60	25	Transco Mainline
1568.4	1568.7	Fauquier	0.3	Pipeline	40	25	Transco Mainline
1568.7	1568.7	Fauquier	<0.1	Pipeline	30	25	Transco Mainline
1568.7	1568.9	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1568.9	1568.9	Fauquier	<0.1	Pipeline	60	25	Transco Mainline
1568.9	1569.1	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1569.1	1569.1	Fauquier	<0.1	Pipeline	70	25	Transco Mainline
1569.2	1569.2	Fauquier	0.0	Railroad	--	--	Norfolk Southern Railroad
1569.2	1569.2	Fauquier	0.0	Road	--	--	Catlett Road
1569.2	1569.2	Fauquier	<0.1	Pipeline	70	25	Transco Mainline
1569.2	1569.7	Fauquier	0.5	Pipeline	40	25	Transco Mainline
1569.7	1569.8	Fauquier	<0.1	Pipeline	30	25	Transco Mainline
1569.8	1569.8	Fauquier	<0.1	Pipeline	70	25	Transco Mainline
1569.8	1569.9	Fauquier	<0.1	Pipeline	40	25	Transco Mainline
1569.9	1569.9	Fauquier	<0.1	Pipeline	30	25	Transco Mainline
1569.9	1570.1	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1570.1	1570.1	Fauquier	<0.1	Pipeline	30	25	Transco Mainline
1570.1	1570.3	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1570.3	1570.4	Fauquier	<0.1	Pipeline	30	25	Transco Mainline
1570.4	1570.4	Fauquier	<0.1	Pipeline	40	25	Transco Mainline
1570.4	1570.4	Fauquier	<0.1	Pipeline	70	25	Transco Mainline

Table 1

Co-location with Existing Corridors for the Southeastern Trail Project

Transco Mainline MP		County	Paralleled Length (miles)	Type of ROW ^a	Width Used for Temporary Construction ROW (feet) ^b	Width Used for Permanent ROW (feet) ^b	Road/Utility Description
Begin	End						
1570.4	1570.8	Fauquier	0.4	Pipeline	40	25	Transco Mainline
1570.8	1570.8	Fauquier	0.0	Road	--	--	Old Dumfries Road
1570.8	1571.0	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1571.0	1571.1	Fauquier	0.1	Pipeline	70	25	Transco Mainline
1571.1	1572.4	Fauquier	1.3	Pipeline	40	25	Transco Mainline
1572.7	1572.8	Fauquier	0.1	Pipeline	65	25	Transco Mainline
1572.8	1573.0	Fauquier	0.2	Pipeline	40	25	Transco Mainline
1573.0	1573.0	Fauquier	0.0	Pipeline	130	25	Prince William Road
1573.0	1573.3	Fauquier / Prince William	0.3	Pipeline	40	25	Transco Mainline
1573.3	1573.3	Prince William	0.0	Road	--	--	Fauquier Drive
1573.3	1573.8	Prince William	0.5	Pipeline	40	25	Transco Mainline
1573.8	1573.9	Prince William	0.1	Pipeline	30	25	Transco Mainline
1573.9	1574.2	Prince William	0.3	Pipeline	40	25	Transco Mainline
1574.2	1574.2	Prince William	<0.1	Pipeline	30	25	Transco Mainline
1574.2	1574.4	Prince William	0.2	Pipeline	40	25	Transco Mainline
1574.4	1574.4	Prince William	0.0	Road	--	--	Reid Lane
1574.4	1574.6	Prince William	0.2	Pipeline	40	25	Transco Mainline
1574.6	1574.6	Prince William	<0.1	Pipeline	65	25	Transco Mainline
1574.6	1574.6	Prince William	<0.1	Pipeline	40	25	Transco Mainline
1574.6	1574.7	Prince William	0.1	Pipeline	70	25	Transco Mainline
1574.7	1574.7	Prince William	<0.1	Pipeline	25	25	Transco Mainline
1574.7	1574.8	Prince William	0.1	Pipeline	40	25	Transco Mainline
1574.8	1574.8	Prince William	<0.1	Pipeline	30	25	Transco Mainline

Table 1

Co-location with Existing Corridors for the Southeastern Trail Project

Transco Mainline MP		County	Paralleled Length (miles)	Type of ROW ^a	Width Used for Temporary Construction ROW (feet) ^b	Width Used for Permanent ROW (feet) ^b	Road/Utility Description
Begin	End						
1574.8	1574.9	Prince William	0.1	Pipeline	40	25	Transco Mainline
1574.9	1574.9	Prince William	0.0	Road	--	--	Fitzwater Drive
1574.9	1575.6	Prince William	0.7	Pipeline	40	25	Transco Mainline
1575.6	1575.6	Prince William	<0.1	Pipeline	30	25	Transco Mainline
1575.6	1575.7	Prince William	0.1	Pipeline	40	25	Transco Mainline
1575.7	1575.7	Prince William	0.0	Road	--	--	Reid Lane
1575.7	1575.8	Prince William	0.1	Pipeline	40	25	Transco Mainline
1575.8	1575.8	Prince William	<0.1	Pipeline	150	25	Transco Mainline
Total			7.4				

a - ROW = right-of-way

b - Amount of proposed construction right-of-way or additional temporary workspace (ATWS) that will overlap the existing ROW or easement.

TABLE 2

Additional Temporary Workspace for the Southeastern Trail Project

ATWS ^a	County	Transco Mainline MP	Temporary Disturbance (acres)	ATWS Justification
Southern / Manassas Loop				
FQ-001	Fauquier	1568.1	1.3	Staging Area / Fabrication
FQ-002	Fauquier	1568.1	7.2	Staging Area / Fabrication
FQ-003	Fauquier	1568.2	0.1	Staging Area / Fabrication
FQ-004	Fauquier	1568.2	0.1	Bore Spoil
FQ-005	Fauquier	1568.2	0.2	Drag Section
FQ-006	Fauquier	1568.3	0.4	Topsoil Segregation
FQ-007	Fauquier	1568.3	0.3	Side Slope
FQ-008	Fauquier	1568.3	0.2	Side Slope
FQ-009	Fauquier	1568.5	0.1	Drag Section
FQ-010	Fauquier	1568.5	0.6	Topsoil Segregation
FQ-010_1	Fauquier	1568.5	0.6	Staging Area / Waterbody Crossing
FQ-010_2	Fauquier	1568.6	0.5	Staging Area / Waterbody Crossing
FQ-012	Fauquier	1568.8	0.1	Waterbody Crossing
FQ-013	Fauquier	1568.8	0.5	Topsoil Segregation
FQ-014	Fauquier	1568.9	0.3	Side Slope
FQ-015	Fauquier	1568.9	0.2	Side Slope
FQ-016	Fauquier	1569.0	0.5	Topsoil Segregation
FQ-017	Fauquier	1569.1	0.6	Staging Area / Spread Turn-around
FQ-018	Fauquier	1569.2	0.1	Road Crossing
FQ-019	Fauquier	1569.1	0.1	Staging Area
FQ-020	Fauquier	1569.2	0.7	Topsoil Segregation
FQ-021	Fauquier	1569.2	0.8	Staging Area / Spread Turn-around
FQ-022	Fauquier	1569.2	0.1	Road Crossing
FQ-023	Fauquier	1569.3	0.1	Side Slope
FQ-024	Fauquier	1569.3	0.5	Staging Area / Turn-around
FQ-025	Fauquier	1569.5	1.2	Topsoil Segregation
FQ-026	Fauquier	1569.4	0.1	Drag Section
FQ-027	Fauquier	1569.6	0.8	Side Slope
FQ-028	Fauquier	1569.8	0.4	Waterbody Crossing
FQ-029	Fauquier	1569.8	0.1	Waterbody Crossing

TABLE 2

Additional Temporary Workspace for the Southeastern Trail Project

ATWS ^a	County	Transco Mainline MP	Temporary Disturbance (acres)	ATWS Justification
FQ-030	Fauquier	1569.8	0.1	Waterbody Crossing
FQ-031	Fauquier	1569.9	0.1	Waterbody Crossing
FQ-032	Fauquier	1569.9	0.3	Topsoil Segregation
FQ-033	Fauquier	1570.0	0.4	Topsoil Segregation
FQ-034	Fauquier	1570.2	0.7	Topsoil Segregation
FQ-035	Fauquier	1570.3	0.2	Side Slope
FQ-036	Fauquier	1570.3	0.2	Waterbody Crossing
FQ-037	Fauquier	1570.4	0.1	Waterbody Crossing
FQ-038	Fauquier	1570.5	0.4	Waterbody Crossing
FQ-039	Fauquier	1570.6	0.1	Side Slope
FQ-040	Fauquier	1570.7	0.1	Side Slope
FQ-041	Fauquier	1570.8	0.7	Staging Area / Road Crossing
FQ-042	Fauquier	1570.8	0.2	Staging Area / Road Crossing
FQ-043	Fauquier	1571.0	0.1	Staging Area / Drag Section
FQ-044	Fauquier	1571.2	0.2	Drag Section
FQ-045	Fauquier	1571.2	0.7	Topsoil Segregation
FQ-046	Fauquier	1571.4	0.6	Topsoil Segregation
FQ-047	Fauquier	1571.6	0.2	Topsoil Segregation
FQ-048	Fauquier	1571.7	0.4	Drag Section / Side Slope
FQ-049	Fauquier	1571.8	0.2	Drag Section / Spoil Storage
FQ-050	Fauquier	1571.9	0.1	Side Slope
FQ-051	Fauquier	1572.0	0.1	Waterbody Crossing
FQ-052	Fauquier	1572.1	0.3	Side Slope
FQ-053	Fauquier	1572.2	0.1	Drag Section
FQ-054	Fauquier	1572.2	0.2	Topsoil Segregation
FQ-055	Fauquier	1572.4	0.5	Topsoil Segregation
FQ-056	Fauquier	1572.4	0.1	Point of Inflection
FQ-057	Fauquier	1572.5	0.1	Point of Inflection
FQ-058	Fauquier	1572.5	0.1	Waterbody Crossing
FQ-059	Fauquier	1572.5	0.1	Waterbody Crossing
FQ-060	Fauquier	1572.6	0.3	Topsoil Segregation
FQ-061	Fauquier	1572.6	0.1	Point of Inflection
FQ-062	Fauquier	1572.7	0.1	Point of Inflection
FQ-063	Fauquier	1572.7	0.2	Waterbody Crossing

TABLE 2

Additional Temporary Workspace for the Southeastern Trail Project

ATWS ^a	County	Transco Mainline MP	Temporary Disturbance (acres)	ATWS Justification
FQ-064	Fauquier	1572.8	0.2	Drag Section
FQ-065	Fauquier	1572.9	1.1	Topsoil Segregation
FQ-066	Fauquier	1573.0	0.5	Staging Area / Fabrication
FQ-067	Fauquier	1573.0	0.2	Staging Area / Fabrication / Topsoil Segregation
FQ-068	Fauquier	1573.0	0.1	Staging Area / Fabrication / Topsoil Segregation
FQ-069	Fauquier	1573.0	0.4	Staging Area / Drag Section
FQ-070	Fauquier / Prince William	1573.1	0.5	Topsoil Segregation
PW-071	Prince William	1573.2	0.1	Drag Section
PW-072	Prince William	1573.3	0.6	Topsoil Segregation
PW-073	Prince William	1573.3	0.1	Road Crossing
PW-074	Prince William	1573.4	0.1	Road Crossing
PW-075	Prince William	1573.4	0.5	Topsoil Segregation
PW-076	Prince William	1573.6	0.5	Topsoil Segregation
PW-077	Prince William	1573.8	0.2	Drag Section
PW-078	Prince William	1574.0	0.2	Wetland Crossing
PW-078_1	Prince William	1574.2	0.2	Staging Area / Waterbody Crossing
PW-078_2	Prince William	1574.2	0.0	Staging Area / Waterbody Crossing
PW-078_3	Prince William	1574.2	0.3	Staging Area / Waterbody Crossing
PW-079	Prince William	1574.3	0.1	Drag Section
PW-080	Prince William	1574.3	0.1	Topsoil Segregation
PW-081	Prince William	1574.3	0.5	Topsoil Segregation
PW-082	Prince William	1574.4	0.6	Staging Area / Road Crossing
PW-083	Prince William	1574.5	0.2	Staging Area / Side-Slope
PW-084	Prince William	1574.5	0.7	Topsoil Segregation
PW-085	Prince William	1574.6	0.1	Spoil Storage
PW-086	Prince William	1574.6	0.2	Drag Section
PW-087	Prince William	1574.7	0.1	Spoil Storage
PW-088	Prince William	1574.7	0.1	Drag Section
PW-089	Prince William	1574.8	0.7	Topsoil Segregation
PW-090	Prince William	1574.8	0.4	Staging Area / Road Crossing
PW-091	Prince William	1574.9	0.1	Staging Area
PW-092	Prince William	1575.1	1.5	Topsoil Segregation
PW-093	Prince William	1575.3	0.6	Side Slope

TABLE 2

Additional Temporary Workspace for the Southeastern Trail Project

ATWS ^a	County	Transco Mainline MP	Temporary Disturbance (acres)	ATWS Justification
PW-094	Prince William	1575.4	0.3	Topsoil Segregation
PW-095	Prince William	1575.5	0.3	Side Slope
PW-096	Prince William	1575.6	0.1	Side Slope / Waterbody Crossing
PW-097	Prince William	1575.7	0.3	Topsoil Segregation
PW-098	Prince William	1575.7	0.6	Staging Area / Fabrication
PW-099	Prince William	1575.8	0.3	Staging Area / Fabrication / Set-up
PW-100	Prince William	1575.9	0.9	Staging Area / Fabrication / Set-up
PW-101	Prince William	1575.9	0.3	Staging Area / Fabrication / Set-up
TOTAL			42.1	
^a – ATWS = additional temporary workspace				

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Amphibians				
American bullfrog	<i>Lithobates catesbeianus</i>	X	X	X
Cope's gray treefrog	<i>Hyla chrysoscelis</i>	X		X
Eastern American toad	<i>Anaxyrus americanus americanus</i>	X	X	X
Eastern mud salamander	<i>Pseudotriton montanus montanus</i>	X		X
Eastern narrow-mouthed toad	<i>Gastrophryne carolinensis</i>			X
Eastern red-backed salamander	<i>Plethodon cinereus</i>	X	X	X
Four-toed salamander	<i>Hemidactylium scutatum</i>	X	X	X
Fowler's toad	<i>Anaxyrus fowleri</i>	X	X	X
Gray treefrog	<i>Hyla versicolor</i>		X	X
Greater siren	<i>Siren lacertina</i>	X		
Green treefrog	<i>Hyla cinerea</i>	X		
Long-tailed salamander	<i>Eurycea longicauda longicauda</i>		X	
Marbled salamander	<i>Ambystoma opacum</i>	X	X	X
Northern cricket frog	<i>Acris crepitans</i>	X	X	X
Northern dusky salamander	<i>Desmognathus fuscus</i>	X	X	X
Northern green frog	<i>Lithobates clamitans melanota</i>	X	X	X
Northern red salamander	<i>Pseudotriton ruber ruber</i>	X	X	X
Northern spring peeper	<i>Pseudacris crucifer crucifer</i>	X	X	X
Northern spring salamander	<i>Gyrinophilus porphyriticus porphyriticus</i>		X	X
Pickereel frog	<i>Lithobates palustris</i>	X	X	X
Red-spotted newt	<i>Notophthalmus viridescens viridescens</i>	X	X	X
Seal salamander	<i>Desmognathus monticola</i>	X		X
Southern leopard frog	<i>Lithobates sphenoccephalus</i>	X		X
Southern two-lined salamander	<i>Eurycea cirrigera</i>			X
Spotted salamander	<i>Ambystoma maculatum</i>	X	X	X
Three-lined salamander	<i>Eurycea guttolineata</i>	X	X	X
Upland chorus frog	<i>Pseudacris feriarum feriarum</i>	X	X	X
White-spotted slimy salamander	<i>Plethodon cylindraceus</i>	X	X	X
Wood frog	<i>Lithobates sylvaticus</i>	X	X	
Reptiles				

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Broad-headed skink	<i>Plestiodon laticeps</i>	X	X	X
Common five-lined skink	<i>Plestiodon fasciatus</i>	X	X	X
Common ribbonsnake	<i>Thamnophis sauritus sauritus</i>	X	X	X
Eastern box turtle	<i>Terrapene carolina carolina</i>	X	X	X
Eastern fence lizard	<i>Sceloporous undulatus</i>	X	X	X
Eastern gartersnake	<i>Thamnophis sirtalis sirtalis</i>	X	X	X
Eastern hognose snake	<i>Heterodon platirhinos</i>	X	X	X
Eastern kingsnake	<i>Lampropeltis getula getula</i>	X	X	X
Eastern milksnake	<i>Lampropeltis triangulum triangulum</i>	X	X	X
Eastern mud turtle	<i>Kinosternon subrubrum subrubrum</i>		X	X
Eastern painted turtle	<i>Chrysemys picta picta</i>	X	X	X
Eastern rat snake	<i>Pantherophis alleghaniensis</i>	X	X	X
Eastern river cooter	<i>Pseudemys concinna concinna</i>	X		
Eastern six-lined racerunner	<i>Aspidozelis sexlineata sexlineata</i>	X	X	X
Eastern smooth earthsnake	<i>Virginia valeriae valeriae</i>	X	X	X
Eastern snapping turtle	<i>Chelydra serpentina serpentina</i>	X	X	X
Eastern wormsnake	<i>Carphophis amoenus amoenus</i>	X	X	X
Little brown skink	<i>Scincella lateralis</i>	X	X	X
Mole kingsnake	<i>Lampropeltis calligaster rhombomaculata</i>	X	X	X
Northern black racer	<i>Coluber constrictor constrictor</i>	X	X	X
Northern brown snake	<i>Storeria dekayi dekayi</i>	X	X	X
Northern copperhead	<i>Agkistrodon contortrix mokasen</i>	X	X	X
Northern red-bellied cooter	<i>Pseudemys rubriventris</i>		X	
Northern red-bellied snake	<i>Storeria occipitomaculata occipitomaculata</i>	X	X	X
Northern ring-necked snake	<i>Diadophis punctatus edwardsii</i>	X	X	X
Northern rough greensnake	<i>Opheodrys aestivus aestivus</i>	X	X	X
Northern scarletsnake	<i>Cemophora coccinea copei</i>	X		X
Northern watersnake	<i>Nerodia sipedon sipedon</i>	X	X	X
Queen snake	<i>Regina septemvittata</i>	X	X	X
Red cornsnake	<i>Pantherophis guttatus</i>	X	X	X

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Southeastern crowned snake	<i>Tantilla coronata</i>			X
Southeastern five-lined skink	<i>Plestiodon inexpectatus</i>	X	X	X
Spotted turtle	<i>Clemmys guttata</i>	X	X	
Stinkpot	<i>Sternotherus odoratus</i>	X	X	X
Timber rattlesnake	<i>Crotalus horridus</i>	X	X	X
Avian				
Red-tailed hawk	<i>Buteo jamaicensis</i>	X		
Wood duck	<i>Aix sponsa</i>		X	
American kestrel	<i>Falco sparverius</i>	X	X	
Wild turkey	<i>Meleagris gallopavo</i>	X	X	
Killdeer	<i>Charadrius vociferus</i>		X	
Rock pigeon	<i>Columba livia</i>	X	X	
Mourning dove	<i>Zenaida macroura</i>	X	X	X
Red-bellied woodpecker	<i>Melanerpes carolinus</i>			X
Barn owl	<i>Tyto alba</i>	X		
Eastern screech-owl	<i>Megascops asio</i>	X		
Chimney swift	<i>Chaetura pelagica</i>		X	
Ruby-throated hummingbird	<i>Archilochus colubris</i>	X		
Northern flicker	<i>Colaptes auratus</i>		X	
Downy woodpecker	<i>Picoides pubescens</i>		X	
Eastern kingbird	<i>Tyrannus tyrannus</i>	X	X	
Great crested flycatcher	<i>Myiarchus crinitus</i>			X
Eastern phoebe	<i>Sayornis phoebe</i>	X		X
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>			X
Barn swallow	<i>Hirundo rustica</i>	X	X	
Purple martin	<i>Progne subis</i>	X	X	X
Blue jay	<i>Cyanocitta cristata</i>	X		X
American crow	<i>Corvus brachyrhynchos</i>	X	X	X
Fish crow	<i>Corvus ossifragus</i>	X	X	
Carolina chickadee	<i>Pecile carolinensis</i>	X		
Tufted titmouse	<i>Baeolophus bicolor</i>	X		
White-breasted nuthatch	<i>Sitta carolinensis</i>	X		
House wren	<i>Troglodytes aedon</i>	X	X	
Carolina wren	<i>Thryothorus ludovicianus</i>	X	X	X
Northern mockingbird	<i>Mimus polyglottos</i>	X	X	X
Brown thrasher	<i>Toxostoma rufum</i>	X	X	X
American robin	<i>Turdus migratorius</i>	X	X	X

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Eastern bluebird	<i>Sialia sialis</i>	X	X	X
Blue-gray gnatcatcher	<i>Poliophtila caerulea</i>	X		
European starling	<i>Sturnus vulgaris</i>		X	
Prairie warbler	<i>Setophaga discolor</i>		X	
House sparrow	<i>Passer domesticus</i>		X	X
Eastern meadowlark	<i>Sturnella magna</i>	X	X	X
Red-winged blackbird	<i>Agelaius phoeniceus</i>	X	X	
Common grackle	<i>Quiscalus quiscula</i>	X	X	X
Scarlet tanager	<i>Piranga olivacea</i>			X
Northern cardinal	<i>Cardinalis cardinalis</i>	X	X	
Blue grosbeak	<i>Guiraca caerulea</i>			X
Indigo bunting	<i>Passerina cyanea</i>	X	X	X
House finch	<i>Haemorhous mexicanus</i>	X		X
Eastern towhee	<i>Pipilo erythrophthalmus</i>	X		
Chipping sparrow	<i>Spizella passerina</i>	X	X	X
Field sparrow	<i>Spizella pusilla</i>	X	X	
Song sparrow	<i>Melospiza melodia</i>		X	
Mammals				
Ashen masked shrew	<i>Sorex cinereus cinereus</i>		X	
Beaver	<i>Castor canadensis</i>	X	X	X
Big brown bat	<i>Eptesicus fuscus fuscus</i>	X	X	X
Bobcat	<i>Lynx rufus rufus</i>	X	X	X
Carolina beaver	<i>Castor canadensis carolinensis</i>			X
Common Gapper's red-backed vole	<i>Clethrionomys gapperi gapperi</i>	X	X	X
Common mink	<i>Mustela vison mink</i>	X	X	X
Common pine vole	<i>Microtus pinetorum pinetorum</i>			X
Common white-footed mouse	<i>Peromyscus leucopus leucopus</i>	X		
Coyote	<i>Canis latrans</i>	X	X	X
Dismal swamp short-tailed shrew	<i>Blarina brevicauda telmalestes</i>	X		
Eastern cottontail	<i>Sylvilagus floridanus mallurus</i>	X	X	X
Eastern gray fox	<i>Urocyon cinereoargenteneus cinereoargenteneus</i>	X	X	X
Eastern harvest mouse	<i>Reithrodontomys humulis virginianus</i>	X	X	

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Eastern mole	<i>Scalopus aquaticus aquaticus</i>	X	X	X
Eastern pipistrelle	<i>Pipistrellus subflavus subflavus</i>	X	X	X
Eastern red bat	<i>Lasiurus borealis borealis</i>	X	X	X
Eastern spotted skunk	<i>Spilogale putorius putorius</i>		X	
Evening bat	<i>Nycticeius humeralis humeralis</i>	X		
Fisher's eastern chipmunk	<i>Tamias striatus fisheri</i>	X	X	X
Fox squirrel	<i>Sciurus niger vulpinus</i>	X	X	X
Gray squirrel	<i>Sciurus carolinensis carolinensis</i>			X
Hairy-tailed mole	<i>Parascalops breweri</i>		X	
Hispid cotton rat	<i>Sigmodon hispidus virginianus</i>	X		X
Hoary bat	<i>Lasiurus cinereus cinereus</i>	X	X	X
House mouse	<i>Mus musculus musculus</i>	X	X	X
Kirtland's short-tailed shrew	<i>Blarina brevicauda kirtlandi</i>	X	X	X
Large-toothed muskrat	<i>Ondatra zibethicus macrodon</i>	X	X	X
Least shrew	<i>Cryptotis parva parva</i>	X	X	X
Least weasel	<i>Mustela nivalis allegheniensis</i>	X	X	X
Lewis' golden mouse	<i>Ochrotomys nuttalli nuttalli</i>			X
Little brown bat	<i>Myotis lucifugus lucifugus</i>	X	X	X
Long-tailed weasel	<i>Mustela frenata noveboracensis</i>	X	X	X
Marsh rice rat	<i>Oryzomys palustris palustris</i>	X		
Meadow jumping mouse	<i>Zapus hudsonius americanus</i>	X	X	X
Meadow vole	<i>Microtus pennsylvanicus pennsylvanicus</i>	X	X	
Northern gray squirrel	<i>Sciurus carolinensis pennsylvanicus</i>	X	X	
Northern myotis	<i>Myotis septentrionalis septentrionalis</i>	X	X	X
Northern river otter	<i>Lontra canadensis laxatina</i>	X	X	X
Northern white-footed mouse	<i>Peromyscus leucopus noveboracensis</i>	X	X	X
Norway rat	<i>Rattus norvegicus norvegicus</i>	X	X	X
Pine vole	<i>Microtus pinetorum scalapsoides</i>	X	X	

Table 3

Representative Wildlife Species Occurring in the Project Vicinity

Common Name	Scientific Name	Counties / Facility		
		Prince William / Manassas Loop	Fauquier / Manassas Loop	Pittsylvania / Station 165
Prairie deer mouse	<i>Peromyscus maniculatus bairdii</i>	X	X	
Pygmy shrew	<i>Sorex hoyi winnemana</i>	X	X	X
Raccoon	<i>Procyon lotor lotor</i>	X	X	X
Red fox	<i>Vulpes vulpes fulva</i>	X	X	X
Silver-haired bat	<i>Lasiorycteris noctivagans</i>	X	X	X
Southeastern shrew	<i>Sorex longirostris longirostris</i>	X	X	X
Southern flying squirrel	<i>Glaucomys volans volans</i>	X	X	X
Star-nosed mole	<i>Condylura cristata cristata</i>	X	X	
Stone's southern bog lemming	<i>Synaptomys cooperi stonei</i>	X	X	
Striped skunk	<i>Mephitis mephitis nigra</i>	X	X	
Talkative red squirrel	<i>Tamiasciurus hudsonicus loquax</i>	X	X	
Virginia opossum	<i>Didelphis virginiana virginiana</i>	X	X	X
White-tailed deer	<i>Odocoileus virginianus</i>	X	X	X
Woodchuck	<i>Marmota monax monax</i>	X	X	X

Source: VDGIF 2018f and VaBBa2 2018

Table 4

Recently Completed, Current and Planned Major Projects in the Project Area

Project Name / Sponsor/Proponent	Location	Distance and Direction from Project Facilities	Project Type / Description	Area Affected	Resource Information	Anticipated Permits / Authorizations	Estimated Development Timeframe	Water Use / Quality (HUC 12)	Fish, Wildlife and Vegetation (HUC 12)	Cultural Resources (Workspace)	Socioeconomics (County)	Geology (Workspaces)	Soils (Workspace)	Land Use, Recreations, and Aesthetics (1 Mile)	Noise (0.25 mile)
VDOT / Route 15/17/29 Warrenton Interchange	Warrenton, Fauquier County, Virginia	7.7 miles northeast of MP 1570.1 of the Manassas Loop	Transportation / Replacement of the existing at-grade intersection of Route 15/17/29, Route 15/17/29 Business and Route 880 (Lord Fairfax Drive) with a grade-separated interchange to improve safety and capacity.	Approximately 725 acres	Existing road ROW ^a and vegetated easements HUC 020700100602 (Owl Run-Cedar Run) Project is in design phase; Field assessments have not been completed based on publically available information. New stormwater ponds may be included in the project. Potential habitat for Northern Long-eared Bat based on IPaC review.	USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Fauquier County	Construction planned to begin in early 2019	X	X		X				
Fauquier County / Fauquier Central Complex	Warrenton, Fauquier County, Virginia	6.5 miles northeast of MP 1570.3 of the Manassas Loop	Recreational / Development of a public recreational sports complex.	82.4 acres	Current agriculture fields HUC 020700100602 (Owl Run-Cedar Run) Wetlands: 0.64 acre PFO; 0.42 acre PSS, 0.001 acre PEM Waterbodies: 570 linear feet Potential habitat for Northern Long-eared Bat based on IpaC review.	USACE 404 USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Fauquier County	2019	X	X		X				
Van Metre Companies / Cunningham Farm and Carter's Crossing	Marshall, Fauquier County, Virginia	17.5 miles northeast of MP 1571.5 of the Manassas Loop	Residential / Construction of 351 new homes as part of two separate developments.	Approximately 43 acres	Current agriculture fields Wetlands and waterbodies do not appear to be present based on desktop review and initial planning documents Potential habitat for Northern Long-eared Bat based on IpaC review.	USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Fauquier County	2018 / 2019 (Planning)				X				
Dominion / New Lines 2086 and 2155	Beaeton, Fauquier County, Virginia	6.0 miles west of MP 1568.13 of the Manassas Loop	Utility / Construction of a temporary transmission line, removal of existing structures and rebuild new double circuit structures in same centerline.	Approximately 11 miles	Existing ROW Additional temporary ROW of 20 feet and taller structures.	USACE 404 USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater VDEQ Air Quality Fauquier County	Planned 2018 construction				X				

Table 4

Recently Completed, Current and Planned Major Projects in the Project Area

Project Name / Sponsor/Proponent	Location	Distance and Direction from Project Facilities	Project Type / Description	Area Affected	Resource Information	Anticipated Permits / Authorizations	Estimated Development Timeframe									
								Water Use / Quality (HUC 12)	Fish, Wildlife and Vegetation (HUC 12)	Cultural Resources (Workspace)	Socioeconomics (County)	Geology (Workspaces)	Soils (Workspace)	Land Use, Recreations, and Aesthetics (1 Mile)	Noise (0.25 mile)	
VDOT / I-66 and Route 15 Interchange Reconstruction	Gainesville, Prince William County, Virginia	5.6 miles north-northwest of MP 1575.8 of the Manassas Loop	Transportation / Reconstruction of the Interstate 66 and U.S. Route 15 interchange.	Approximately 150 acres	Existing road ROW and vegetated easements Wetlands: 0.37 acres Waterbodies: 1,171 linear feet	USACE 404 USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Prince William County	Completed in Summer 2017				X					
Prince William County / Vint Hill Road Extension	Nokesville Prince William County, Virginia	1.2 miles north-northwest of MP 1575.8 of the Manassas Loop	Transportation / Widening of Vint Hill Road west of the intersection with Sudley Manor Drive (Route 1566) to the intersection with Kettle Run Road (Route 656).	1.14 miles	Existing road easement HUC 020700100503 (Kettle Run) Wetland and waterbody impacts (not quantified; estimated less than 1 acre based on desktop review) Potential habitat for Northern Long-eared Bat and Harperella plant based on IpaC review.	USACE 404 USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Prince William County	Construction planned to be completed in September 2019	X	X		X					
Dominion / New Line 2174	Nokesville Prince William County, Virginia	0.7 miles northeast of MP 1575.8 of the Manassas Loop	Utility / Construction of a new transmission line along a 100-foot wide ROW. Includes a substation expansion at Warrenton and addition of a switching station at Wheeler and Vint Hill.	Approximately 6 miles	HUC 020700100503 (Kettle Run) Potential habitat for Northern Long-eared Bat and Harperella plant based on IpaC review.	USACE 404 USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Prince William County	2017 / 2018	X	X		X				X	
Fluvanna County / Farm Heritage Museum	Palmyra, Fluvanna County, Virginia	8.3 miles north-northeast of Station 175	Public Use / Construct a Farm Museum building that will house and display a variety of farm equipment that may have been used on a family farm.	Less than 1 acre	Existing developed land; No impacts.	VDEQ Stormwater Fluvanna County	2018 / 2019				X					
VDOT / Route 53 and Route 618	Lake Monticello, Fluvanna County, Virginia	7.0 miles north-northeast of Station 175	Transportation / Construction of a single-lane roundabout at the intersection of Route 53 and Route 618 (Lake Monticello Road).	Approximately 5 acres	Existing road ROW and vegetated easements Wetland and waterbody impacts (not quantified; estimated less than 1 acre based on desktop review).	USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Fluvanna County	2019				X					

Table 4

Recently Completed, Current and Planned Major Projects in the Project Area

Project Name / Sponsor/Proponent	Location	Distance and Direction from Project Facilities	Project Type / Description	Area Affected	Resource Information	Anticipated Permits / Authorizations	Estimated Development Timeframe	Water Use / Quality (HUC 12)	Fish, Wildlife and Vegetation (HUC 12)	Cultural Resources (Workspace)	Socioeconomics (County)	Geology (Workspaces)	Soils (Workspace)	Land Use, Recreations, and Aesthetics (1 Mile)	Noise (0.25 mile)
								X	X		X	X	X	X	X
EQT Midstream Partners / Mountain Valley Pipeline	Chatham, Pittsylvania County, Virginia	Located adjacent to Station 165	Utility / Construction 19.9 miles (out of 303 miles) of a new natural gas pipeline system in Pittsylvania County, Virginia that would span from the north of West Virginia to the south of Virginia.	289 acres	HUC 030101050104 (Cherrystone Creek) Wetlands – 1.39 acres permanent impacts; 2.4 acres temporary impacts Waterbodies – 248 linear feet (crossings) Potential impacts to Indiana bat; northern long-eared bat; Roanoke logperch; running buffalo clover; small whorled pogonia; shale barren rock cress; Virginia spiraea (based on BA; specific locations along 303 mile route not provided).	FERC (CP16-10-000 and CP16-13-000) USACE 404 USFWS VDGIF VDCR Virginia SHPO VDEQ Stormwater Pittsylvania County	Planned in-service date in 2019	X	X		X	X	X	X	X
VDOT / U.S. Route 29 South over Norfolk Southern Railroad	Chatham, Pittsylvania County, Virginia	4.3 miles northwest of Station 165	Transportation / Replacement of the bridge on U.S. Route 29 South over Norfolk Southern Railroad.	4.1 acres	HUC 030101050104 (Cherrystone Creek) Information not available.	USFWS (Coordination) VDGIF (Coordination) VDCR (Coordination) Virginia SHPO VDEQ Stormwater Pittsylvania County	2017	X	X		X				
Mountain Valley Pipeline / Southgate Project	Pittsylvania County, VA; and Rockingham, Alamance Counties, NC	MVP Southgate Lambert Compressor Station is 0.06 mile southwest of Transco Compressor Station 166 and 0.25 mile southwest of Compressor Station 165	Utility / Construction 73.5 miles of a new natural gas pipeline system and compressor station in Pittsylvania County, Virginia that would span from Virginia into North Carolina.	1417 acres construction / 438 acres operation	HUC 030101050104 (Cherrystone Creek).	FERC (CP19-14-000) USACE 404 USFWS VDGIF VDCR SHPO VDEQ NCDEQ Stormwater	Planned in-service date in 2020	X	X		X			X	X

Table 4

Recently Completed, Current and Planned Major Projects in the Project Area

Project Name / Sponsor/Proponent	Location	Distance and Direction from Project Facilities	Project Type / Description	Area Affected	Resource Information	Anticipated Permits / Authorizations	Estimated Development Timeframe	Water Use / Quality (HUC 12)	Fish, Wildlife and Vegetation (HUC 12)	Cultural Resources (Workspace)	Socioeconomics (County)	Geology (Workspaces)	Soils (Workspace)	Land Use, Recreations, and Aesthetics (1 Mile)	Noise (0.25 mile)
Transco / Virginia Southside Expansion	Chatham, Pittsylvania County, Virginia	Located adjacent to Station 165	Utility / Approximately 10 miles (out of 100 miles total) of new 24-inch diameter pipeline from Transco mainline in Pittsylvania County, Virginia and into Halifax, Charlotte, and Mecklenburg. Terminates in Brunswick County, Virginia. Operated by Transco.	75.8 acres	HUC 030101050203 (Shockoe Creek-Banister River) Wetlands – 2.6 acres Waterbodies – 0.2 acres No Effect or No Adverse determination for RTE species.	FERC (CP13-30) (033) USACE 404 USFWS VDGIF VDCR Virginia SHPO VDEQ Stormwater Pittsylvania County	2015 (in-service)	X	X		X	X	X	X	X

^a ROW = right-of-way

APPENDIX D
SITE SPECIFIC
RESIDENTIAL SITE
CONSTRUCTION
PLANS



Transcontinental Gas Pipe Line Company LLC
RESIDENTIAL CONSTRUCTION PLAN
SOUTHEASTERN TRAIL PROJECT
PROPOSED 42" MANASSAS LOOP
M.P. 1568.13 TO M.P. 1575.85
FAUQUIER AND PRINCE WILLIAM COUNTIES, VIRGINIA

DRAWING NUMBER	SHEET	REVISION
26-0100-55-06D-D/1569.35-01	1 OF 2	0
26-0100-55-06D-D/1569.35-01	2 OF 2	0
26-0100-55-06D-D/1574.18-01	1 OF 2	0
26-0100-55-06D-D/1574.18-01	2 OF 2	0

ISSUED DATE: 04-04-2018

CEDAR RUN DISTRICT

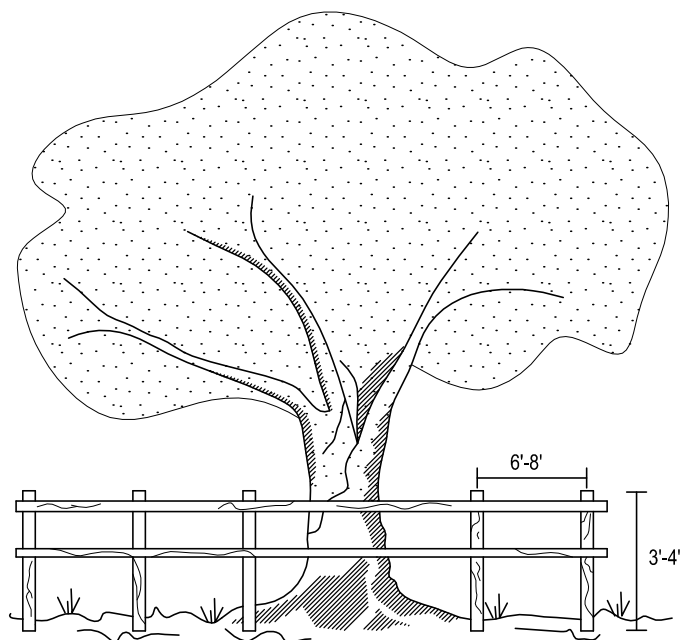
NOTES:

- CONSTRUCTION TECHNIQUES TO BE USED TO MINIMIZE IMPACT TO THIS RESIDENCE ARE DENOTED ON SHEET 1 OF THIS DRAWING. CONSTRUCTION TECHNIQUES INCLUDE REDUCED PIPELINE SEPARATION (N), DRAG SECTION (D), WORKING OVER EXISTING PIPELINE (W), PIPELINE CROSSOVERS (C), REDUCED CONSTRUCTION RIGHT-OF-WAY (R).
- EXCAVATION OF THE PIPELINE TRENCH WILL NOT BE INITIATED UNTIL THE PIPE IS READY FOR INSTALLATION. THE PIPELINE TRENCH SHALL BE BACKFILLED IMMEDIATELY UPON COMPLETION OF THE PIPELINE INSTALLATION.
- HOMEOWNER SHALL BE NOTIFIED ONE (1) WEEK PRIOR TO EXCAVATION OF PIPELINE TRENCH.
- CONSTRUCTION SAFETY PERIMETER FENCING SHALL BE INSTALLED AND MAINTAINED ALONG THE WORK AREA. "SEE LOCATION DETAIL THIS SHEET. REMOVE AFTER RESTORATION IS COMPLETE."
- ALL FEATURES WITHIN THE CONSTRUCTION WORK AREA OR LIMITS OF DISTURBANCE SHALL BE REMOVED EXCEPT AS NOTED ON THE DRAWING. MATURE TREES AND LANDSCAPING WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA MAY BE SAVED UNLESS NECESSARY TO REMOVE FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT.
- CONTRACTOR SHALL MAINTAIN RESIDENTIAL ACCESS AT ALL TIMES. IF APPLICABLE, CONTRACTOR SHALL PROVIDE PRIOR NOTICE TO COMPANY WHEN THE EXISTING DRIVEWAY IS PLANNED TO BE OPEN CUT. COMPANY SHALL THEN NOTIFY THE HOMEOWNER(S). DRIVEWAY ACCESS MAY BE TEMPORARILY CLOSED FOR THE PIPELINE INSTALLATION, STEEL PLATES SHALL BE USED ACROSS THE OPEN TRENCH IF NOT BACKFILLED DURING SAME WORK DAY.
- THIS PROPERTY

<input type="checkbox"/> (DOES)	<input type="checkbox"/> (DOES NOT) HAVE A SEPTIC SYSTEM
<input type="checkbox"/> (DOES)	<input type="checkbox"/> (DOES NOT) HAVE A WATER WELL
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
- A MOBILE WATER TRUCK WILL BE USED TO CONTROL DUST ON THE R.O.W. AS NEEDED.
- TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC IS OFFERING PRE-CONSTRUCTION AND POST-CONSTRUCTION MONITORING PROGRAM. THE HOMEOWNER:

<input type="checkbox"/> ACCEPTS	<input type="checkbox"/> DECLINES TO PARTICIPATE
----------------------------------	--

BARRICADE DETAIL FOR PROTECTED AND GRAND TREES

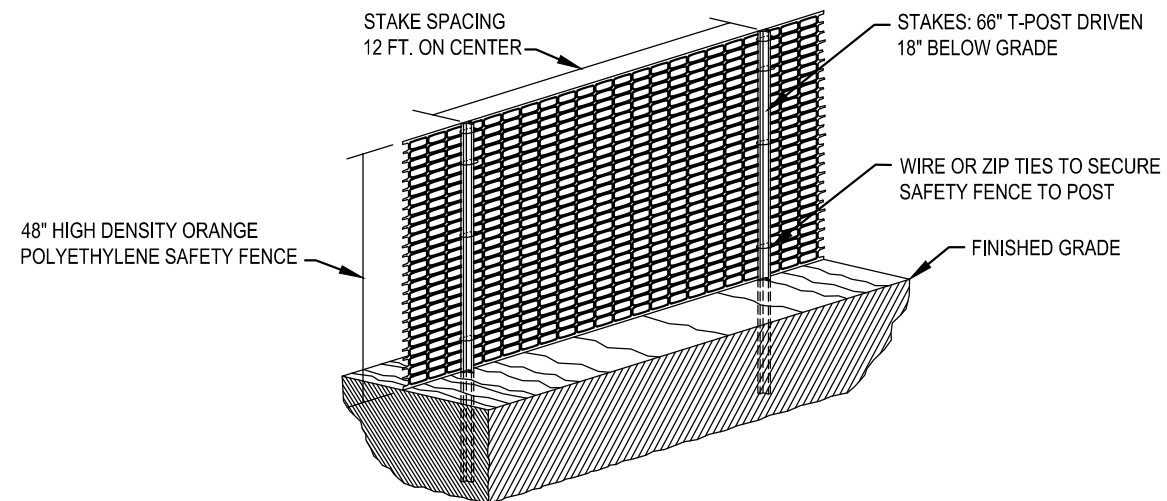


HORIZONTAL: WOOD MEMBER, ORANGE FENCING, CHAIN LINK FENCE OR OTHER APPROVED MATERIAL

VERTICAL: WOOD MEMBER OR APPROVED MATERIAL BARRICADES PLACED AT DESIGNATED PROTECTIVE ROOT ZONE.

- ALL SENSITIVE AREAS SHALL BE PROTECTED AS PER PLAN.
- WHEN PRACTICABLE, INSTALL HIGH VISIBILITY FENCE 3 FEET OUTSIDE THE DRIP LINE OF THE TREE.
- SAFETY FENCE SHOULD BE FASTENED SECURELY TO THE POST.
- THE FENCE MUST REMAIN IN PLACE DURING ALL PHASES OF CONSTRUCTION; ANY CHANGE OF THE PROTECTIVE FENCING MUST BE APPROVED.

SAFETY FENCE



LEGEND	
	PROPOSED 42" MANASSAS LOOP
	EXISTING 30" TGPL MAINLINE "A"
	EXISTING 30" TGPL MAINLINE "B"
	EXISTING 36" TGPL MAINLINE "C"
	EXISTING TGPL R/W
	PROPOSED TGPL R/W
	PROPERTY LINE
	ROAD EASEMENT
	UTILITY EASEMENT
	LIMITS OF DISTURBANCE
	WETLAND AREA
	CONSTRUCTION SAFETY FENCE
	STREAM CROSSING
	RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
	SINGLE TREE
	TREE LINE
	EXISTING FENCE
	SANITARY SEWER
	WATER LINE
	CABLE LINE
	OVERHEAD POWER LINE
	POWER POLE

WOOD GROUP USA, INC.

0 TYP. SAFETY FENCE LOCATION
LIMITS OF DISTURBANCE
SAFETY FENCE

THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC RESIDENTIAL CONSTRUCTION PLAN SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FOR THE PROPERTY OF TRACT NO. VA-FA-021-000 CEDAR RUN DISTRICT FAUQUIER COUNTY, VIRGINIA						
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: FH	DATE: 03/06/18	ISSUED FOR BID:	SCALE: N.T.S.
0	04/04/18	FH	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 03/06/18	ISSUED FOR CONSTRUCTION:	REVISION: 0
							APPROVED BY: EL	DATE: 03/06/18	DRAWING NUMBER: 26-0100-55-06D-D/1569.35-01	
							WO: 1199779	ROUTE ID:101 CIVIL: 02/26/18 7:59am	3/28/2018	Mark Ho
							AND: 02/26/18 ENV: 02/26/18	K:\MAPPING\VA\MAIN\LOOP\1568_17\LAND\AC0\26-0100-55-06D-D_1569.35-01.dwg		SHEET 2 OF 2

BRENTSVILLE DISTRICT

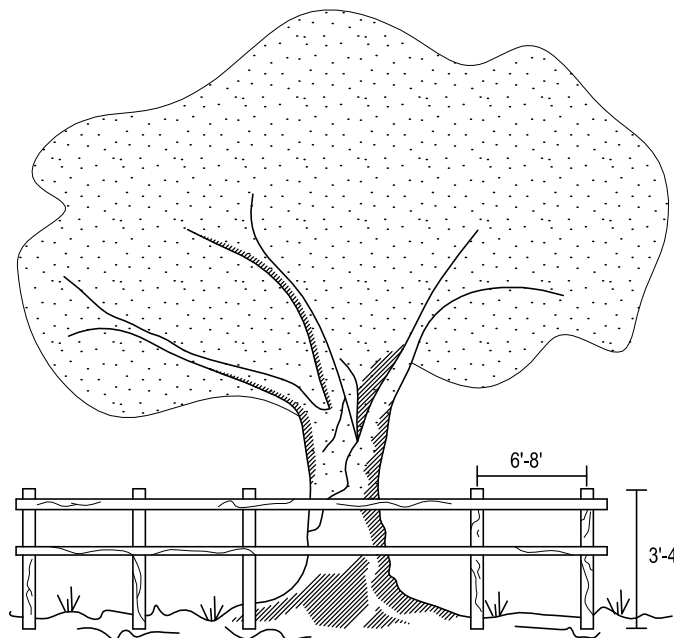
NOTES:

- CONSTRUCTION TECHNIQUES TO BE USED TO MINIMIZE IMPACT TO THIS RESIDENCE ARE DENOTED ON SHEET 1 OF THIS DRAWING. CONSTRUCTION TECHNIQUES INCLUDE REDUCED PIPELINE SEPARATION (N), DRAG SECTION (D), WORKING OVER EXISTING PIPELINE (W), PIPELINE CROSSOVERS (C), REDUCED CONSTRUCTION RIGHT-OF-WAY (R).
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- ALL FEATURES WITHIN THE CONSTRUCTION WORK AREA OR LIMITS OF DISTURBANCE SHALL BE REMOVED EXCEPT AS NOTED ON THE DRAWING. MATURE TREES AND LANDSCAPING WITHIN THE EDGE OF THE CONSTRUCTION WORK AREA MAY BE SAVED UNLESS NECESSARY TO REMOVE FOR SAFE OPERATION OF CONSTRUCTION EQUIPMENT.
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- THIS PROPERTY

<input type="checkbox"/>	(DOES)	<input type="checkbox"/>	(DOES NOT) HAVE A SEPTIC SYSTEM
<input type="checkbox"/>	(DOES)	<input type="checkbox"/>	(DOES NOT) HAVE A WATER WELL
<input type="checkbox"/>			
<input type="checkbox"/>			
<input type="checkbox"/>			
- A MOBILE WATER TRUCK WILL BE USED TO CONTROL DUST ON THE R.O.W. AS NEEDED.
- TRANSCONTINENTAL GAS PIPE LINE COMPANY, LLC IS OFFERING PRE-CONSTRUCTION AND POST-CONSTRUCTION MONITORING PROGRAM. THE HOMEOWNER:

<input type="checkbox"/>	ACCEPTS	<input type="checkbox"/>	DECLINES TO PARTICIPATE
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BARRICADE DETAIL FOR PROTECTED AND GRAND TREES

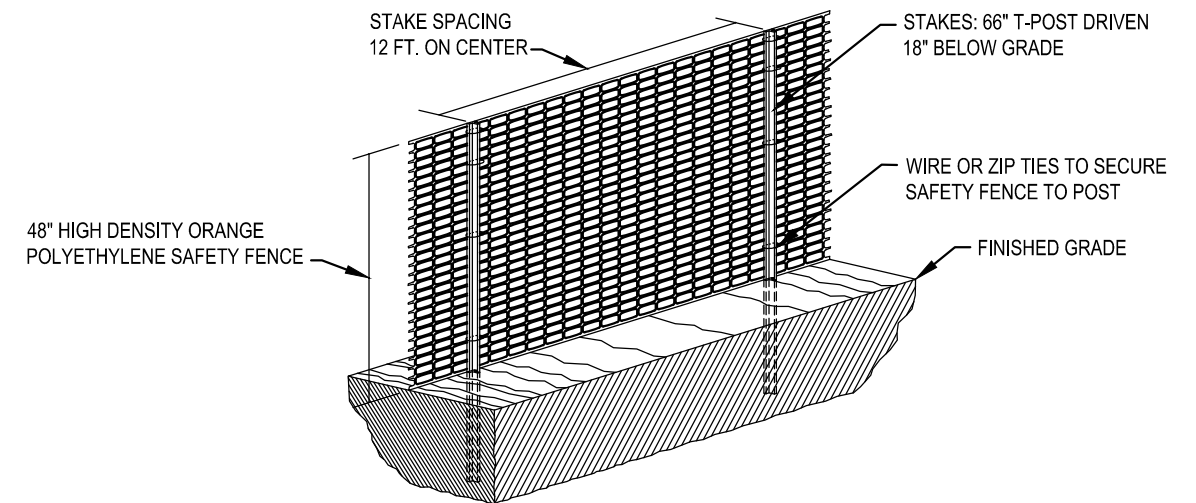


HORIZONTAL: WOOD MEMBER, ORANGE FENCING, CHAIN LINK FENCE OR OTHER APPROVED MATERIAL

VERTICAL: WOOD MEMBER OR APPROVED MATERIAL BARRICADES PLACED AT DESIGNATED PROTECTIVE ROOT ZONE.

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SAFETY FENCE



LEGEND	
	PROPOSED 42" MANASSAS LOOP
	EXISTING 30" TGPL MAINLINE "A"
	EXISTING 30" TGPL MAINLINE "B"
	EXISTING 36" TGPL MAINLINE "C"
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	ROAD EASEMENT
	UTILITY EASEMENT
	LIMITS OF DISTURBANCE
	WETLAND AREA
	CONSTRUCTION SAFETY FENCE
	STREAM CROSSING
	RESIDENTIAL STRUCTURE WITHIN 50' OF CONSTRUCTION
	SINGLE TREE
	TREE LINE
	EXISTING FENCE
	SANITARY SEWER
	WATER LINE
	CABLE LINE
	OVERHEAD POWER LINE
	POWER POLE

WOOD GROUP USA, INC.

SAFETY FENCE LOCATION
LIMITS OF DISTURBANCE
SAFETY FENCE

THE LOCATION OF THE SAFETY FENCES SHOWN IN THE PLAN IS APPROXIMATE AND ADJUSTED FOR CLARITY. SAFETY FENCES LOCATED NEAR THE LIMITS OF DISTURBANCE SHALL BE INSTALLED AT THE LIMIT LINE AS SHOWN ABOVE.

DRAWING NO.		REFERENCE TITLE		TRANSCONTINENTAL GAS PIPE LINE COMPANY LLC RESIDENTIAL CONSTRUCTION PLAN SOUTHEASTERN TRAIL PROJECT PROPOSED 42" MANASSAS LOOP FOR THE PROPERTY OF TRACT NO. VA-FA-054-000 BRENTSVILLE DISTRICT PRINCE WILLIAM COUNTY, VIRGINIA							
NO.	DATE	BY	REVISION DESCRIPTION	W.O. NO.	CHK.	APP.	DRAWN BY: FH	DATE: 03/06/18	ISSUED FOR BID:	SCALE: N.T.S.	
0	04/04/18	FH	ISSUED FOR FERC FILING	1199779	W.	MJH	CHECKED BY: W.	DATE: 03/06/18	ISSUED FOR CONSTRUCTION:	REVISION: 0	
							APPROVED BY: EL	DATE: 03/06/18	DRAWING NUMBER: 26-0100-55-06D-D/1574.18-01		
							WO: 1199779	ROUTE ID:101 CIVIL: 02/26/18 7:58am	3/28/2018	MarkHo	SHEET 2 OF 2

APPENDIX E
NORTHERN LONG-
EARED BAT
STREAMLINED
CONSULTATION
FORM

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service’s (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	YES	NO
1. Does the project occur wholly outside of the WNS Zone ¹ ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Have you contacted the appropriate agency ² to determine if your project is near known hibernacula or maternity roost trees?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Could the project alter the entrance or interior environment of a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant³ (Name, Email, Phone No.):

Agency-Federal Energy Regulatory Commission

Applicant-Transcontinental Gas Pipe Line Company, LLC (Transco)

Joseph Dean

Manager of Permitting

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¹ <http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>

² See <http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html>

³ If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

Project Name: Southeastern Trail Project

Project Location (include coordinates if known): Modifications to forest habitat that could be used by the NLEB will be limited to areas located along the Manassas Loop and Station 165.

Manassas Loop Coordinates	Latitude	Longitude
Beginning	38.628157° N	77.669103° W
Fauquier County and Prince William County Line	38.688733° N	77.621128° W
End	38.721291° N	77.591202° W
Station 165 Coordinates	Latitude	Longitude
Center	36.830573° N	79.339097° W

Basic Project Description (provide narrative below or attach additional information):

Transco is proposing to provide 296.375 thousand dekatherms per day (Mdt/d) of additional firm transportation capacity from the Pleasant Valley Interconnect facility (Dominion Energy Cove Point Pipeline) in Fairfax County, Virginia to the existing Station 65 pooling point located in St. Helena Parish, Louisiana. The project is referred to as the Southeastern Trail Project (Project). The Project will consist of 7.72 miles of new natural gas pipeline (Manassas Loop) located along the existing Transco Mainline, compressor station horsepower additions at three existing facilities in Virginia (Station 185, Station 175, and Station 165), reversal and / or deodorization modifications at eight existing Mainline Facilities in South Carolina, Georgia, and Louisiana, and modifications at 13 existing Mainline Valve (MLV) Sites in South Carolina and Georgia.

Transco completed a Project Review Package in accordance with the USFWS Virginia Field Office requirements which resulted in the generation of a Self-Certification Letter. The Self Certification Letter and Project Review Package was submitted to the USFWS Virginia Field Office on August 20, 2018. The USFWS provided an email on August 20, 2018 confirming receipt of the submittal. As stated in the confirmation email, the Self-Certification Letter was assumed to be the USFWS official response given that no other communications were received from the USFWS and it has been more than 30 days since submittal.

General Project Information	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the project occur within 150 feet of a known maternity roost tree?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the project include forest conversion ⁴ ? (if yes, report acreage below)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Estimated total acres of forest conversion	54.0	
If known, estimated acres ⁵ of forest conversion from April 1 to October 31	UnKnown-Self Imposed TOYR (April	

⁴ Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).

⁵ If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.

