Maryland
Department of
the Environment

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor

Ben Grumbles, Secretary
Horacio Tablada, Deputy Secretary

February 14, 2019

Re: Notice of Permit Decision
Nontidal Wetlands and Waterways Permit Application
Tracking Number 17-NT-3376 / 201762188

Dear Property Owner, Public Official or Interested Person:

After examination and consideration of the documents received and evidence in the application file and record for the Columbia Gas Transmission Line 8000 Replacement Project, the Water and Science Administration has determined that the application meets the statutory and regulatory criteria necessary for issuance of a Nontidal Wetlands and Waterway Permit. Copies of the permit, the Line 8000 Replacement Project Overview Map, and the Summary of the Basis for Decision are enclosed with this permit decision. The Aquatic Resource Crossing Drawings that detail the impacts to wetland and waterway resources are available at the MDE website under the Public Information heading using the following link: http://mde.maryland.gov/programs/Water/WetlandsandWaterways/Pages/index.aspx
Hard copies can also be requested from the MDE Wetlands and Waterways office at (410) 537-3213.

This is a final agency determination; there is no further opportunity for administrative review. Any person with standing, who is either the applicant or who participated in the public participation process through the submission or written or oral comments may petition for judicial review in the Circuit Court in the County where the permitted activity is to occur. The petition for judicial review must be filed within 30 days of the publication of the permit decision. Please see the attached Fact Sheet for additional information about the judicial review process. If you have any questions or need any additional information, please do not hesitate to contact Bill Seiger, Chief, Waterway Construction Division at 410-537-3821.

Sincerely,

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

Enclosures: Summary Basis for Decision
Nontidal Wetlands and Waterways Permit
Line 8000 Replacement Project Overview Map

FACT SHEET
JUDICIAL REVIEW PROCESS

Permits can be challenged through a request for direct judicial review in the Circuit Court for the county where the activity authorized by the permit will occur. Applicants, and persons who meet standing requirements under federal law and who participated in a public comment process by submitting written or oral comments (where an opportunity for public comment was provided), may seek judicial review. Judicial review will be based on the administrative record for the permit compiled by the Department and limited to issues raised in the public comment process (unless no public comment process was provided, in which case the review will be limited to issues that are germane to the permit).

Who Has Standing?
Anyone who meets the threshold standing requirements under federal law and is either the applicant or someone who participated in the public participation process through the submission of written or oral comments, as provided in Environment Article § 5-204, Annotated Code of Maryland. The three traditional criteria for establishing standing under federal law are injury, causation, and redressability, although how each criterion is applied is highly fact-specific and varies from case to case. Further, an association has standing under federal law to bring suit on behalf of its members when its members would otherwise have standing to sue in their own right, the interests at stake are germane to the organization's purpose, and neither the claim asserted nor the relief requested requires the participation of individual members in the lawsuit.

What is the Procedure for Seeking Judicial Review?
Petitions for judicial review of a final determination or permit decision subject to judicial review must be filed in accordance with § 1-605 of the Environment Article no later than 30 days following publication by the Department of a notice of final determination or final permit decision and must be filed in the circuit court of the county where the permit application states that the proposed activity will occur. Petitions for judicial review must conform to the applicable Maryland Rules of Civil Procedure.

To review the legislation follow the link below:
http://mlis.state.md.us/2009rs/chapters_noln/Ch_650_sb1065T.pdf

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
NOTICE OF DECISION

In the Matter of: Columbia Gas Transmission, LLC
Nontidal Wetlands and Waterways Permit
Application Number 17-NT-3376 / 201762188

Decision: Approval

Date: February 14, 2019

The review of the Nontidal Wetlands and Waterways Permit Application in the above-referenced matter has been governed by criteria set forth under Title 5, Subtitle 5, Environment Article, Annotated Code of Maryland, entitled Appropriation or Use of Waters, Reservoirs, and Dams; Subtitle 9, Environment Article, Annotated Code of Maryland, entitled Nontidal Wetlands; and Code of Maryland Regulations (COMAR) Title 26, Subtitle 17, Chapter 04, Construction on Nontidal Waters and Floodplains and Subtitle 23 Nontidal Wetlands. The Nontidal Wetlands and Waterways Permit Application has been reviewed for compliance with Maryland water quality standards under COMAR Title 26, Subtitle 08, Chapter 02 Water Quality.

After examination of all documents and evidence in the above-referenced matter, I have determined that:

1. The applicant has demonstrated a need for impacts to nontidal wetlands, the 25-foot nontidal wetland buffer, waterways, and the 100-year floodplain;
2. The applicant has minimized impacts to nontidal wetlands, the 25-foot nontidal wetland buffer, waterways, and the 100-year floodplain,
3. No rare, threatened or endangered species have been identified in the area of impact from the proposed project;
4. No historical or archeological sites have been identified in the area of impact for the proposed project;
5. The project is consistent with State water quality requirements;
6. Public notice and public informational hearing requirements have been satisfied; and,
7. The applicant has demonstrated that the project has independent utility from any potential future projects.

Nontidal Wetlands and Waterways Permit Application 17-NT-3376 / 201762188 meets the criteria set forth in statute and regulation governing impacts to wetlands and waterways. Nontidal Wetlands and Waterways Permit Number 17-NT-3376 / 201762188 may be issued by the Water and Science Administration to authorize Columbia Gas Transmission, LLC to conduct regulated activities in Allegany County associated with the replacement of approximately 13.2 miles of 12 inch diameter, bare steel, natural gas pipeline with approximately 13.32 miles of new 12 inch diameter, coated steel pipeline, the replacement of four lateral pipelines totaling approximately 0.57 miles, and construction of aboveground facilities including one launcher / receiver site and four mainline valves. The work includes crossing environmental resources using open trench and trenchless methods (i.e. horizontal directional drill or jack and bore). The project will permanently convert 2,646 square feet of forested nontidal wetland to emergent nontidal wetland; temporarily impact 19,534 square feet of emergent nontidal wetland; and temporarily impact 192,411 square feet of the 25-foot nontidal wetland buffer; permanently impact 69 linear feet (207 square feet) and temporarily impact 3,129 linear feet (15,091 square feet) of perennial and intermittent streams; and permanently impact 483 square feet and temporarily impact 78,791 square feet of regulated floodplain. Mitigation is required for this project. The Applicant has agreed to pay into the Nontidal Wetlands

Compensation Fund to satisfy the required mitigation. The project alignment extends from the state line at Mineral County, West Virginia, approximately one mile west of MD 220, to Allendale Avenue in Allegany County.

A brief explanation of the rationale for this decision is contained in the attached Summary of Basis for Decision.

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

SUMMARY BASIS FOR DECISION

Columbia Gas Transmission LLC Name of Applicant	17-NT-3376/201762188 Application Number
Paul Busam / Matthew Radcliffe Project Manager(s)	February 14, 2019 Date of Decision

The Environment Article, Annotated Code of Maryland and the Code of Maryland Regulations establish criteria for the Maryland Department of the Environment (Department or MDE) to consider when evaluating projects that propose to change the course, current or cross section of a nontidal stream or other body of water or to impact a nontidal wetland. If the criteria are satisfied, the Department may issue a permit for the proposed activity. The Department may deny a permit for a waterway construction activity that it believes is inadequate, wasteful, dangerous, impracticable or detrimental to the best public interest. The Department may not issue a nontidal wetland permit for a regulated activity unless it finds that the applicant has demonstrated that a regulated activity, which is not water-dependent, has no practicable alternative, will minimize alteration or impairment of the nontidal wetlands, and will not cause or contribute to a degradation of ground or surface waters.

In the case of the proposed construction of the Line 8000 Replacement Project, the question for the Department to address is whether or not the proposed project impacts are acceptable under the regulations as they pertain to such construction activities.

PUBLIC NOTICE

Adjoining property owners, local government officials and other interested persons must be notified of proposed impacts to nontidal wetlands and waterways. In addition, an opportunity to comment and request a public informational hearing must be provided via a local newspaper. The public notice on this application was published in *Cumberland Times-News* on January 1, 2019.

A public informational hearing was not requested. Comments received by the Department during the public comment period included the following:

- Right of Way Agreements
    - Columbia's representatives met with the commenters. MDE contacted the commenters after the response to ensure all had been adequately addressed. To address the right of way concerns more broadly, a special condition was added the permit clarifying that Columbia must obtain a legal right of way from all owners of properties on which regulated activities will be conducted.
- Scope of Work & Time Frame for Construction
    - Information regarding the scope of work on their property or adjacent parcels, or the time frame proposed for the construction, was provided to the commenters.

MDE contacted the commenters after the response to ensure they had answers to their questions.

- Location and Safety of the Launcher / Receiver
    - Regarding the location and safety of the launcher / receiver, Columbia provided the following information:

The facilities proposed in this filing will be designed, constructed, operated, and maintained in accordance with the USDOT Pipeline and Hazardous Materials Safety Administration's (PHMSA) Minimum Federal Safety Standards stated in Title 49 of CFR Part 192. Columbia also maintains operating policies and procedures, which are periodically reviewed by USDOT. All operating personnel are thoroughly trained to perform their activities in accordance with these policies and procedures.

Regulatory requirements pertaining to safety shall also be reinforced by Columbia's comprehensive and strictly enforced corporate practices. Columbia conducts regular surveys and inspections of its facilities through aerial inspections, leak detection surveys, and cathodic protection rectifier inspections. Aerial and ground patrols of pipelines and aboveground facilities are performed, in addition to scheduled preventative maintenance. Unusual situations or conditions are reported and investigated immediately.

To comply with CFR 49 Part 192, Subpart O – Gas Transmission Pipeline Integrity Management and TransCanada's Integrity Management Program, the pipeline is required to be internally inspected at a minimum of ten-year increments as a safety precaution. This requires the installation of a Launcher assembly at the beginning and end of the pipeline segment. The pipeline commences at the LaVale Station (at Allendale Avenue). TransCanada has sited the proposed Launcher assembly at the rear of the property and immediately adjacent to the existing fenced-in facility. The Launcher assembly is a safety feature with the purpose of launching an internal inspection tool through the pipeline to locate any corrosion or pipeline defects. This assembly has been designed to a Class 3 design factor, for a design pressure two times greater than the operating pressure of the pipeline. Note that the majority of the above-grade components of this assembly will only be pressurized during the internal inspection, or other non-routine pipeline operations.

MDE contacted the commenters after the response to ensure they had answers to their questions.

- Impacts on Wells From Blasting
    - Columbia provided the following information to address these concerns.

Columbia has identified areas along the right-of-way with potential for shallow depth to bedrock where blasting may be required. However, the technique used for bedrock removal will depend on such factors as strength and hardness of the rock. Columbia will first attempt to use mechanical methods, such as ripping, hydraulic hammers or conventional excavation, to remove the bedrock where possible. If dense, consolidated bedrock without fractures (lithic bedrock) is encountered and the use of hydraulic hammers or other mechanical methods are ineffective, blasting may be required.

Columbia has developed a Project Blasting Plan in the event blasting is required during construction. Additionally, if blasting is required, Columbia will require the construction contractor to develop a site-specific Blasting Plan for Columbia's approval, prior to any blasting activities. The blasting specifications will meet or exceed applicable federal, regional, state, and local requirements, and all applicable permits will be obtained associated with the use of explosives. MDE and the West Virginia Department of Environmental Protection (WVDEP) have standard regulations and policies in the event of blasting. Blasting precautions will be included in the Blasting Plan. Blasting precautions include, but are not limited to, the following:

- *Inventorying public and private groundwater drinking wells in the proximity of the construction work area (typically within 150 feet) and completing pre- and post-blast (within two months of construction work restoration) water quality testing, if requested by the landowner;*
- *Completing pre-blast inspections and, if necessary, seismographic monitoring of nearby residences (within 150 feet of construction right-of-way) and other structures by an independent contractor;*
- *Installing blasting mats in congested areas, in shallow waterbodies, or near structures that could be damaged by fly-rock;*
- *Posting visual and audible warning signals, flags, and barricades to ensure personnel safety;*
- *Notifying occupants of nearby buildings, stores, residences, places of business, and places of public gathering, as well as farmers, at least 48 hours in advance of blasting activities;*
- *Notifying the local fire marshal of blasting activities prior to blasting. The fire marshal must be notified the day of blasting via phone or email;*
- *Following procedures for safe storage, handling, transportation, loading, firing, and disposal of explosive materials;*
- *Conduct a three-axis seismic survey for each blast event within 300 feet of a Columbia pipeline, unless otherwise permitted by Columbia; and • Monitor ground vibration and air-blast using peak particle velocity measurements when seismographic monitoring is necessary.*

A pre-blasting survey will be conducted, with landowner permission, to assess the conditions of structures and wells within 150 feet of the blasting area. The survey may include the following:

- *Discussions with adjacent property owners to familiarize them with blasting effects and planned precautions to be taken by Columbia;*
- *Identification of site-specific structures, utilities, and water wells;*
- *Detailed examination of photographs, and/or video records of adjacent structures and utilities; and/or*
- *Detailed mapping and measurement of large cracks, crack patterns, and other evidence of structural stress observed in specific structures.*

The results of the survey will be summarized in a report that will be completed prior to the initiation of blasting in the specific area. If property owners identify damage or change to properties, or if excessive peak particle velocities have been recorded during the blasting operations, Columbia will perform an additional post-blasting survey of the affected

properties to verify the damage. Once confirmed, Columbia will either repair the damage or fairly compensate the owner for blast-related damages.

- MDE contacted the commenters after the response to ensure they had the answers to their questions.

- Stabilization of Construction Areas.
  - Columbia provided the following information to address these concerns.

During pipeline installation, Columbia will use construction methods and erosion and sediment (E&S) controls specific to the State of Maryland to control stormwater runoff. These methods are intended to ensure the protection of Maryland's streams, rivers, and the Chesapeake Bay. The E&S controls that will be implemented during construction were identified to manage stormwater runoff from construction activities to reduce stream channel erosion, pollution, siltation, sedimentation and local flooding.

Columbia has developed detailed wetland and waterbody crossing plans for all impacted resources associated with the project in accordance with the Maryland Department of the Environment (MDE) Waterway Construction Guidelines. These impacts are subject to review and approval by Maryland Department of the Environment (MDE) and the United States Army Corps of Engineers (USACE) under the Section 404/401 Water Quality Regulations. Additionally, Columbia developed project-specific E&S Plans in accordance with both the 2011 Maryland Standards and Specifications for Soil Erosion and Sediment Control as well as the 2000 Maryland Design Manual. These Plans are currently under review and subject to approval by the Allegany County Soil Conservation District. The project-specific E&S Plans identify procedures to stabilize all areas of disturbance and ensure topography is restored to its preconstruction contours.

After construction, all disturbed areas and stream banks will be stabilized and restored in accordance with the USACE, MDE and Allegany County permit conditions. As such, Columbia will restore disturbed areas to pre-construction contour elevations, which will not alter the current drainage patterns. All waterbodies crossed by the proposed pipeline will be restored to pre-construction elevations and stabilized. All steep slopes within the disturbed right-of-way will be covered with an engineered soil stabilization matting to increase slope stabilization.

- The Sediment and Erosion Control Plan is addressed under *Water Quality* below. Where questions were related to the Sediment and Erosion Control Plans, the commenters were referred to the Allegany County Soil Conservation District. MDE contacted the commenters to ensure they had answers to their questions.

It is important to note that the Department's decision is confined to the issues relevant to the Department's Wetland and Waterways authority and are addressed in the appropriate sections herein. Comments raised that are not directly within the scope of the Department's review were referred to the applicant.

PROJECT PURPOSE AND NEED

In order for the Department to authorize impacts to nontidal wetlands and their regulated buffers, regulated activities must be determined to be necessary and unavoidable to meet the basic project purpose. It is also important to note that the orderly development and use of land is regulated through planning and zoning controls implemented by the local government. In this particular instance, Allegany County makes the decision about appropriate land use of the property.

The project's purpose is to increase system reliability and reduce the risk of interruption to Columbia's customers. To that end, Columbia Gas Transmission, LLC has proposed the replacement of approximately 13.2 miles of 12 inch diameter, bare steel natural gas pipeline, originally installed in 1952, with approximately 13.32 miles of new 12 inch diameter coated steel pipeline. The project also includes the replacement of four lateral pipelines totaling approximately 0.57 miles, and aboveground facilities including one launcher / receiver site and four mainline valves.

ALTERNATIVES ANALYSIS

For projects that are not water-dependent, the applicant must conduct an alternatives analysis to demonstrate that the project has no practicable alternative. The factors to be considered are whether the project purpose can be accomplished using one or more alternative sites in the general area; a reduction in the size, scope, configuration or density would result in less impact; the applicant made a good faith effort to accommodate the site constraints that caused the alternative sites to be rejected; and that the regulated activity is necessary for the project to meet a demonstrated public need.

The replacement pipeline closely parallels the existing Line 8000 right of way and utilizes that existing right of way to the greatest extent practicable. In most areas, the replacement pipeline will be offset by 10 to 25 feet which will allow the existing line to remain in service during the construction period. The alignment of the new pipeline varies from the existing alignment in some areas in order to avoid disturbance to large wetland and stream complexes.

AVOIDANCE AND MINIMIZATION

If the alternative site analysis is accepted, the applicant must demonstrate that adverse impacts to nontidal wetlands, their regulated buffers, and the 100-year frequency floodplain are necessary and unavoidable.

Even before applying to the Department for this permit, Columbia had undertaken certain avoidance and minimization measures. The applicant performed extensive field investigations to determine a route which minimized impacts to jurisdictional resources. The replacement pipeline closely parallels the existing line. Where large wetland /stream complexes were found in the existing right of way, the applicant realigned the new pipeline to avoid those resources. The use of horizontal directional drilling was proposed to avoid impacts at the North Branch of the Potomac River and McCoole FMA as well as at the Fore Sisters Golf Course.
The original application listed permanent stream impacts of 181 linear feet (1,517 square feet), temporary stream impacts of 5,038 linear feet (23,277 square feet), temporary floodplain impact of 55,704 square feet, permanent conversion of 4,981 square feet of forested nontidal wetland to emergent nontidal wetland, temporary impacts to 32,782 square feet of emergent nontidal

wetland, and 133,038 square feet of 25-foot nontidal wetland buffer. Revisions to the plans, including relocation of some areas of the temporary workspace, the decision to abandon the existing pipeline in place, corrections made to the stream and floodplain delineations, and the use of conventional underground boring methods in five locations (i.e. jack and bore), resulted in permanent stream impacts of 69 linear feet (207 square feet), temporary stream impacts of 3,129 linear feet (15,091 square feet), permanent floodplain impacts of 483 square feet, temporary floodplain impacts of 78,791 square feet, permanent conversion of 2,646 square feet of forested nontidal wetland to emergent nontidal wetland, temporary impacts of 19,534 square feet of emergent nontidal wetland, and 192,411 square feet of 25-foot nontidal wetland buffer.

In addition to eliminating impacts, Columbia will implement a number of measures to minimize its impacts during and after construction of the pipeline. To reduce impacts to riparian vegetation, the width of the limit of disturbance at stream crossings was reduced from 50 feet to 35 feet, where practicable. Columbia will use temporary construction access bridges to span streams and nontidal wetland areas for needed access. Columbia will use timber mats in regulated areas and will not drive directly on or through nontidal wetlands or streams. The Project plans incorporate best management practices (BMPs) and waterway construction guidelines for work in regulated areas. Temporarily impacted resources will be restored in accordance with the permit best management practices and the approved plans.

WATER QUALITY

i. Erosion and Sediment Control Measures; Stormwater Management Practices

Erosion and sediment control measures and stormwater management practices are designed to prevent the degradation of ground and surface water quality. Sediment pollution is addressed under Maryland's Erosion and Sediment Control Act. The law mandates local Soil Conservation Districts to review and approve erosion and sediment control plans developed in accordance with State standards. The Department's programmatic responsibilities are limited to promulgating regulations, and developing standards, ordinances and other criteria necessary to administer an erosion and sediment control program, including program oversight and delegation of enforcement authority to local governments. As a result, the ***Allegany County Soil Conservation District*** is responsible for the review and approval of an erosion and sediment control plan for the proposed project.

Stormwater discharges are addressed under Maryland's Stormwater Management Act. The law requires counties and municipalities to "adopt ordinances necessary to implement a stormwater management program." The Department's programmatic responsibilities are limited to promulgating regulations defining the minimum features of a stormwater ordinance and program oversight. The Department also reviews the stormwater management program of the counties and municipalities and their field implementation and requires corrective action where a program is found deficient. For most projects, compliance with the County-issued stormwater management approval ensures that the project will not degrade water quality, but for projects affecting Tier II waters, the Department will require a separate anti-degradation analysis. In this particular case, however, the ***Allegany County Land Development Services*** is responsible for the review and approval of the project's stormwater management plan.

During the application review process, the Department verifies that appropriate best management practices are incorporated into the sediment and erosion control plans and the stormwater

management plans to protect the State's water resources. In order to insure that these practices are contained in the project's final design plans, the applicant will submit approved sediment and erosion control plans and stormwater management plans to the Department prior to the commencement of construction activities authorized by the Permit. A number of comments were received regarding the post project stabilization. No change to the existing grade or drainage area is proposed. Specific questions regarding the stabilization of upland areas were referred to the Allegany County Soil Conservation District.

ii. Horizontal Directional Drilling Contingency Plan (HDDCP)

Because there is the potential for inadvertent releases to occur during HDD activities, which could cause the release of drilling mud containing bentonite (fine clay) and (possibly) additives into the waterways, the Department required Columbia to develop a Horizontal Directional Drilling Contingency Plan. Columbia's plan, which MDE approved, includes:

- Training the contractor in the provisions of the HDDCP;
- Job briefings to be held daily;
- Monitoring of the drill pressure and drilling fluid returns;
- Monitoring of the site including a visual inspection of the surface areas;
- Response equipment available on-site in case of a release;
- Response procedures; and
- Notification and reporting procedures.

Columbia will notify MDE in the event of any inadvertent release of drilling materials. In addition, if the release occurs in the Potomac River, Columbia will notify the operators of potentially affected downstream public water intakes. (See HDD Contingency Plan and Special Conditions.)

iii. Drilling Fluid and Additives

A drilling fluid which consists of water and bentonite clay is used in HDD operations to lubricate and cool the drill bit and carry rock cuttings to the surface. The permit contains a special condition stating that no additives are permitted without prior approval from the Administration. Columbia may submit for pre-approval a list of thickening additives to be stored on site in order to prevent delays in the drilling operation. Any additive must be certified in conformance with ANSI/NSF Standard 60 (Drinking Water Treatment Chemicals - Health Effects) and used in the manner indicated in the certification of the additive.

i. Drilling Fluid Discharges and Hydrostatic Testing

During this HDD process, drilling fluid consisting of bentonite clay and water will be circulated through the hole to power and lubricate the cutting bit, remove cuttings to the surface, and maintain the integrity of the hole. Columbia will obtain the water from a municipal source. Excess drilling fluids and processed spoils will hauled off and disposed at an approved receiving facility. (See FERC RR-6 Appendix D)
Columbia will obtain water for testing sections of pipe and appurtenances from a municipal source and trucked to the Project location. After testing is complete, water will be hauled off and disposed at an approved receiving facility. (See FERC RR-2)

ENDANGERED SPECIES

Once the application is received, it goes through a screening process. This screening process uses Geographical Information System (GIS) to determine the proposed site location and whether or not there are designated resources in the area such as rare, threatened or endangered species. If there are resources identified, the Division sends copies of the proposed plan to the appropriate agencies to review and send comments.

The application was reviewed by the Maryland Department of Natural Resources. That agency had no comments regarding rare, threatened, or endangered species, but did express a number of Fisheries concerns including the following:

- Minimize clearing in the vicinity of the McCoole Fishery Management Area (between Westernport Road and the North Branch of the Potomac River).
    - Workspace in this area is minimized by the use of horizontal directional drilling (HDD). The disturbance includes only the minimum area necessary for the HDD installation, to grout the abandoned pipe at the railroad, and to the remove existing above ground facilities.
- Coordinate access to the McCoole FMA with the Western Regional Fisheries Manager.
    - This item was incorporated into the sequence of construction for this area.
- Adhere to the Use III time of year work restriction for all instream work between Bel Air and the Potomac.
    - This item is addressed in a Special Condition to the Permit.

HISTORIC PRESERVATION

The application was also screened using GIS for historical and archeological resources.

The application was reviewed by the Maryland Historic Trust which determined that the project would have no adverse impact on historical or archeological resources.

MITIGATION

Mitigation is only a consideration in a permit decision after steps have been taken to avoid and minimize impacts to nontidal wetlands and their regulated buffers, and nontidal waterways, including the 100-year floodplain.

The project will permanently convert 2,646 square feet of forested nontidal wetland to emergent nontidal wetland. Mitigation is required for 2,646 square feet of wetland based on a 1:1 ratio for conversion impacts. The applicant has agreed to pay into the Nontidal Wetlands Compensation Fund to satisfy the required mitigation in accordance COMAR 26.23.04.

STATE OF MARYLAND
DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
NONTIDAL WETLANDS AND WATERWAYS PERMIT

PERMIT NUMBER: **17-NT-3376/201762188**

EFFECTIVE DATE: February 14, 2019

EXPIRATION DATE: February 14, 2024

PERMITTEE: Columbia Gas Transmission, LLC
700 Louisiana Street
Houston, Texas 77002
Attn: Ernest Ladkani

IN ACCORDANCE WITH ENVIRONMENT ARTICLE §5-503(a) AND §5-906(b), ANNOTATED CODE OF MARYLAND (2007 REPLACEMENT VOLUME), COMAR 26.17.04 AND 26.23.01, AND 26.08.02 AND THE ATTACHED CONDITIONS, **Columbia Gas Transmission, LLC** ("PERMITTEE"), IS HEREBY AUTHORIZED BY THE WATER AND SCIENCE ADMINISTRATION ("ADMINISTRATION") TO CONDUCT A REGULATED ACTIVITY IN A NONTIDAL WETLAND, BUFFER, OR EXPANDED BUFFER, AND/OR TO CHANGE THE COURSE, CURRENT OR CROSS-SECTION OF WATERS OF THE STATE, IN ACCORDANCE WITH THE ATTACHED PLANS APPROVED BY THE ADMINISTRATION ON **February 14, 2019** ("APPROVED PLAN") AND PREPARED BY **Arcadis U.S., Inc.** AND INCORPORATED HEREIN, AS DESCRIBED BELOW:

Install approximately 13.32 miles of new 12 inch diameter coated steel, natural gas pipeline to replace the existing 12 inch diameter, bare steel pipeline. The project also includes the replacement of four lateral pipelines totaling approximately 0.57 miles, and aboveground facilities including one launcher / receiver site and four mainline valves. The project will permanently impact 69 linear feet (207 square feet) and temporarily impact 3,129 linear feet (15,091 square feet) of perennial and intermittent streams, permanently impact 483 square feet and temporarily impact 78,791 square feet of regulated floodplain, permanently convert 2,646 square feet of forested nontidal wetland to emergent nontidal wetland, temporarily impact 19,534 square feet of emergent nontidal wetland, and temporarily impact 192,411 square feet of the 25-foot nontidal wetland buffer. The project alignment extends from the state line at Mineral County, West Virginia, approximately one mile west of MD 220, to Allendale Avenue in Allegany County.

MD Grid Coordinates: 200222 x 228840

Denise M. Keehner
Program Manager
Wetlands and Waterways Program

Attachments: Conditions of Permit
Special Conditions of Permit
Best Management Practices
HDD Contingency Plan
SPCC
Plans

cc: WSA Compliance Program w/file
Donald Bole, U.S. Army Corps of Engineers
Daniel Ley, Arcadis U.S., Inc.

1. **Validity:** Permit is valid only for use by Permittee. Permit may be transferred only with prior written approval of the Administration. In the event of transfer, transferee agrees to comply with all terms and conditions of Permit.
2. **Initiation of Work, Modifications and Extension of Term**: Permittee shall initiate authorized activities in waterways, including streams and the 100-year floodplain, within two (2) years of the Effective Date of this Permit or the Permit shall expire. [Annotated Code of Maryland, Environment Article 5-510(a)-(b) and Code of Maryland Regulations 26.17.04.12]. Permittee may submit written requests to the Administration for (a) extension of the period for initiation of work, (b) modification of Permit, including the Approved Plan, or, (c) not later than 45 days prior to Expiration Date, an extension of term. Requests for modification shall be in accordance with applicable regulations and shall state reasons for changes, and shall indicate the impacts on nontidal wetlands, streams, and the floodplain, as applicable. The Administration may grant a request at its sole discretion. (Annotated Code of Maryland, Environment Article 5-510(c), and Code of Maryland Regulations 26.17.04.12, and Annotated Code of Maryland, Environment Article 5-907 and Code of Maryland Regulations 26.23.02.07).
3. **Responsibility and Compliance**: Permittee is fully responsible for all work performed and activities authorized by this Permit shall be performed in compliance with this Permit and Approved Plan. Permittee agrees that a copy of the Permit and Approved Plan shall be kept at the construction site and provided to its employees, agents and contractors. A person (including Permittee, its employees, agents or contractors) who violates or fails to comply with the terms and conditions of this Permit, Approved Plan or an administrative order may be subject to penalties in accordance with §5-514 and §5-911, Department of the Environment Article, Annotated Code of Maryland (2007 Replacement Volume).
4. **Failure to Comply**: If Permittee, its employees, agents or contractors fail to comply with this Permit or Approved Plan, the Administration may, in its discretion, issue an administrative order requiring Permittee, its employees, agents and contractors to cease and desist any activities which violate this Permit, or the Administration may take any other enforcement action available to it by law, including filing civil or criminal charges.
5. **Suspension or Revocation**: Permit may be suspended or revoked by the Administration, after notice of opportunity for a hearing, if Permittee: (a) submits false or inaccurate information in Permit application or subsequently required submittals; (b) deviates from the Approved Plan, specifications, terms and conditions; (c) violates, or is about to violate terms and conditions of this Permit; (d) violates, or is about to violate, any regulation promulgated pursuant to Title 5, Department of the Environment Article, Annotated Code of Maryland as amended; (e) fails to allow authorized representatives of the Administration to enter the site of authorized activities at any reasonable time to conduct inspections and evaluations; (f) fails to comply with the requirements of an administrative action or order issued by the Administration; or (g) does not have vested rights under this Permit and new information, changes in site conditions, or amended regulatory requirements necessitate revocation or suspension.
6. **Other Approvals**: Permit does not authorize any injury to private property, any invasion of rights, or any infringement of federal, State or local laws or regulations, nor does it obviate the need to obtain required authorizations or approvals from other State, federal or local agencies as required by law.
7. **Site Access:** Permittee shall allow authorized representatives of the Administration access to the site of authorized activities during normal business hours to conduct inspections and evaluations necessary to assure compliance with this Authorization. Permittee shall provide necessary assistance to effectively and safely conduct such inspections and evaluations.
8. **Inspection Notification:** Permittee shall notify the Administration's Compliance Program at least five (5) days before starting authorized activities and five (5) days after completion. For Allegany, Garrett, and Washington Counties, Permittee shall call 301-689-1480. For Carroll, Frederick, Howard, Montgomery and Prince George's Counties, Permittee shall call 301-665-2850. For Baltimore City, Anne Arundel, Baltimore, Calvert, Charles, and St. Mary's Counties, Permittee shall call 410-537-3510. For Caroline, Cecil, Dorchester, Harford, Kent, Queen Anne's, Somerset, Talbot, Wicomico and Worcester Counties, Permittee shall call 410-901-4020. If Permit is for a project that is part of a mining site, please contact the Land and Materials Administration's Mining Program at 410-537-3557 at least five (5) days before starting authorized activities and five (5) days after completion.
9. **Sediment Control:** Permittee shall obtain approval from the Allegany County Soil Conservation District for a grading and sediment control plan specifying soil erosion control measures. The approved grading and sediment control plan shall be included in the Approved Plan, and shall be available at the construction site.
10. **Best Management Practices During Construction:** Permittee, its employees, agents and contractors shall conduct authorized activities in a manner consistent with the Best Management Practices specified by the Administration.
11. **Disposal of Excess:** Unless otherwise shown on the Approved Plan, all excess fill, spoil material, debris, and construction material shall be disposed of outside of nontidal wetlands, nontidal wetlands buffers, and the 100-year floodplain, and in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands.
12. **Temporary Staging Areas:** Temporary construction trailers or structures, staging areas and stockpiles shall not be located within nontidal wetlands, nontidal wetlands buffers, or the 100-year floodplain unless specifically included on the Approved Plan.
13. **Temporary Stream Access Crossings:** Temporary stream access crossings shall not be constructed or utilized unless shown on the Approved Plan. If temporary stream access crossings are determined necessary prior to initiation of work or at any time during construction, Permittee, its employees, agents or contractors shall submit a written request to the Administration and secure the necessary permits or approvals for such crossings before installation of the crossings. Temporary stream access

crossings shall be removed and the disturbance stabilized prior to completion of authorized activity or within one (1) year of installation.

14. **Discharge:** Runoff or accumulated water containing sediment or other suspended materials shall not be discharged into waters of the State unless treated by an approved sediment control device or structure.
15. **Instream Construction Prohibition:** To protect important aquatic species, motor driven construction equipment shall not be allowed within stream channels unless on authorized ford crossings. Activities within stream channels are prohibited as determined by the classification of the stream (COMAR 26.08.02.08): The North Branch of the Potomac River is a Use I waterway; in-stream work may not be conducted from March 1 through June 15 inclusive, of any year. All other waterways impacted by the project are Use III waterways; in-stream work may not be conducted from October 1 through April 30 inclusive, of any year.
16. **Instream Blasting:** Permittee shall obtain prior written approval from the Administration before blasting or using explosives in the stream channel.
17. **Minimum Disturbance:** Any disturbance of stream banks, channel bottom, wetlands, and wetlands buffer authorized by Permit or Approved Plan shall be the minimum necessary to conduct permitted activities. All disturbed areas shall be stabilized vegetatively no later than seven (7) days after construction is completed or in accordance with the approved grading or sediment and erosion control plan.
18. **Restoration of Construction Site:** Permittee shall restore the construction site upon completion of authorized activities. Undercutting, meandering or degradation of the stream banks or channel bottom, any deposition of sediment or other materials, and any alteration of wetland vegetation, soils, or hydrology, resulting directly or indirectly from construction or authorized activities, shall be corrected by Permittee as directed by the Administration.
19. **Mitigation:** Permittee shall mitigate for the conversion 2,646 square feet of forested nontidal wetland to emergent nontidal wetland by paying into the Nontidal Wetland Compensation Fund in lieu of creating the equivalent of at least 2,646 square feet of wetland pursuant to COMAR 26.23.04.

SPECIAL CONDITIONS OF PERMIT

1. Prior to commencement of horizontal directional drill (HDD) activities, the Permittee shall provide an Independent Environmental Monitor (IEM) to ensure compliance with the scope and conditions of this Permit. The Independent Environmental Monitor shall be selected in consultation with the Administration, be on site at all times during HDD activities, and report directly to the Administration's Compliance Program.
2. Instream construction prohibitions shall be in effect for all instream work and for Horizontal Directional Drilling (HDD). The North Branch of the Potomac River is a Use I waterway; in-stream work may not be conducted from March 1 through June 15 inclusive, of any year.
3. All waterways between of Bel Air and the North Branch of the Potomac River are subject to the Use III time of year work prohibition; in-stream work may not be conducted from October 1 through April 30 inclusive, of any year.
4. The Horizontal Directional Drilling Contingency Plan shall be in effect and implemented during all Horizontal Directional Drilling activities.
5. The drilling fluid used in Horizontal Directional Drilling operations shall consist of water and bentonite clay. No additives are permitted without prior approval from the Administration. The Permittee may submit for pre-approval a list of thickening additives to be stored on site in order to prevent delays in the drilling operation. Any additive must be certified in conformance with ANSI/NSF Standard 60 (Drinking Water Treatment Chemicals - Health Effects) and used in the manner indicated in the certification of the additive.
6. The Permittee with oversight by the Independent Environmental Monitor, will conduct visual monitoring of the Potomac River from a boat or drone during all HDD operations under the river from sunrise to sunset.
7. Compliance with the Spill Prevention Control and Countermeasure Plan (SPCC) shall become a condition of this Permit (see attached).
8. Prior to hydrostatic testing of the gas line, Permittee must provide the Administration with specific information relative to the source of test water and the manner and location in which the water will be disposed. If the source or waste location of the water involves other than municipal water and sewer systems, the Department must approve the plan prior to line testing.
9. Permittee shall identify the downstream public drinking water intake facilities and maintain a list of emergency contact numbers. In the event of an inadvertent release of drilling fluid or pollution event to the Potomac River, the Permittee shall immediately notify the operators of potentially affected downstream public drinking water intake facilities.
10. Prior to the start of work, the Permittee shall provide to the Wetlands and Waterways Program a copy of the final, approved Sediment and Erosion Control Plans.
11. The Permittee will finalizing access agreements with the owners of properties on which regulated activities will be conducted. Nothing in this permit shall be construed as granting permission to conduct regulated activities on properties which the Permittee has not obtained a legal right of way.

FEDERALLY MANDATED STATE AUTHORIZATIONS

The State of Maryland issued a Water Quality Certification to the U.S. Army Corps of Engineers for projects receiving federal authorization under the Maryland State Programmatic General Permit, Regional General Permit for Chesapeake Bay Total Maximum Daily Load (TMDL) Activities and non-suspended Nationwide Permits. In addition, as applicable, this Permit constitutes the State's concurrence with the Applicant's certification that the activities authorized herein are consistent with the Maryland Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act of 1972, as amended. Activities in the following counties are not subject to the Maryland Coastal Zone Management requirement: Allegany, Carroll, Frederick, Garrett, Howard, Montgomery, and Washington.

U.S. ARMY CORPS OF ENGINEERS AUTHORIZATION

The U.S. Army Corps of Engineers has reviewed this activity under the Maryland State Programmatic General Permit (MDSPGP-5), as a Category B activity. The Corps authorization will be sent separately by the Corps. The terms and conditions of the MDSPGP-5 should be followed when performing the authorized work.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1) No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
2) Place materials in a location and manner which does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
3) Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
4) Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
5) Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
6) Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
7) All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (Lolium multiflorum), Millet (Setaria italica), Barley (Hordeum sp.), Oats (Uniola sp.), and/or Rye (Secale cereale). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. **Kentucky 31 fescue shall not be utilized in wetland or buffer areas.** The area should be seeded and mulched to reduce erosion after construction activities have been completed.
8) After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
9) To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

   Use I waters: In-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
   Use III waters: In-stream work shall not be conducted during the period October 1 through April 30, inclusive, during any year.
   Use IV waters: In-stream work shall not be conducted during the period March 1 through May 31, inclusive, during any year.

10) Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
11) Culverts shall be constructed and any riprap placed so as not to obstruct the movement of aquatic species, unless the purpose of the activity is to impound water.

Columbia Gas Transmission

HORIZONTAL DIRECTIONAL DRILLING CONTINGENCY PLAN

If an inadvertent release of drilling fluid is detected, call the Columbia Monitoring Center immediately at 1-800-835-7191.

1.1 INTRODUCTION AND DESCRIPTION OF WORK

Columbia Gas Transmission, LLC (Columbia), a TransCanada Company proposes to construct a new 13.5-mile 12-inch diameter natural gas transmission pipeline equipped with a launcher/receiver at each end of the proposed pipeline. The Line 8000 Replacement Project aims at improving the safety and integrity of the TCO system by replacing the existing 12" bare pipe on Line 8000 in Mineral County, West Virginia and Allegany County, Maryland. This project will offset lay a new 12-inch coated pipeline to replace the existing pipeline (vintage 1958 and 1952). This project includes two Horizontal Directional Drill installations including crossings of the North Potomac River and the Fore Sisters Golf Course.

Columbia is proposing to utilize horizontal directional drilling (HDD) technique for selected crossings located along the Project.

Directional drilling operations have a potential to release drilling fluids, such as bentonite, into the surface environmental through inadvertent returns (a condition where drilling mud is released through a fractured bedrock into the surrounding rock and soils and travels toward the surface). Drilling muds typically consist largely of a bentonite clay-water mixture and are not classified as toxic or hazardous substances. However, the HDD construction contractor may need to add non-toxic/non-hazardous additives to the drilling fluid, in the event it is needed to condition the drilling fluid and ensure the HDD hole is being stabilized/cleaned effectively. Columbia will obtain prior approval from the Maryland Department of the Environment (MDE) Administration for any proposed thickening additives and will ensure they are certified in conformance with ANSI/NSF Standard 60 and used in the manner indicated in the certification of the additive. If the drilling fluid is released into a waterbody, bentonite has the potential to adversely impact fish and invertebrates. A Safety Data Sheet for bentonite has been included in this Plan as Attachment 1.

All personnel and sub-contractors responsible for the work must adhere to this plan during the directional drilling process.

The specific objectives of this plan are to:

1. Minimize the potential for an inadvertent return of drilling materials associated with directional drilling activities;
2. Provide for the timely detection of inadvertent returns of drilling materials;
3. Protect the environmentally sensitive waterbodies and wetlands within the Project workspace and within the vicinity of the Project workspace;
4. Ensure an organized, timely, and minimum-impact response in the event of an inadvertent return of drilling materials; and
5. Ensure that all appropriate notifications are made immediately to the customer, management and safety personnel.

2.1 INADVERTENT RETURN

The term inadvertent drilling fluid return refers to the ponding of drilling fluids at the ground surface in an area where it is not anticipated. The most obvious sign that an inadvertent return may have occurred includes a prolonged loss of circulation sometimes coupled with a decrease in the annular pressure of the drilling fluid within the HDD bore. One of the many functions of the drilling fluid is to create a low permeability filter cake along the HDD bore walls to seal the bore and allow for drilling fluid flow back to the HDD entry and/or exit locations. The presence of the filter cake along with the drilling fluid pressure acting on the filter cake combines to support the HDD bore to maintain an active flow path for drilling fluid flow through the HDD bore. A reduction of the returning fluid at the HDD entry/exit location or an observed downhole bore pressure drop are signs that drilling fluids are leaving the HDD bore and migrating/flowing into the surrounding geotechnical formation. Whether these fluids reach the ground surface to create an inadvertent return is a function of the quickness of the drilling crew in reacting to the observed reduced flow or pressure condition.

Drilling fluid losses to the surrounding geotechnical materials is normal to all HDD installations, as this is the way the bentonite particles within the drilling fluids are deposited along the HDD bore walls to create the filter cake. These losses are referred to as formation losses and typically do not result in the flow of drilling fluids to the ground surface. Drilling fluid losses that result in inadvertent return events consist of large drilling fluid volume losses that continue to flow through the geotechnical materials until the fluid pressure driving the flow dissipates. When these fluids reach and pond on the ground surface, an inadvertent return has occurred. Monitoring of drilling fluid flow and downhole annular bore pressures during an HDD installation provides a means to quickly determine whether drilling fluid losses are occurring and whether these losses could result in an inadvertent return at the ground surface.

Understanding of the geotechnical conditions and designing an HDD installation in favorable ground conditions with appropriate depths of cover beneath critical features plays an important role in minimizing the risk of an inadvertent return occurrence. This process includes performing a geotechnical investigation to determine the soil and bedrock conditions and their properties. With this information, predictions of the required and allowable drilling fluid pressures can be completed for an HDD installation to determine the adequacy of the depth of an HDD installation. Adequate separation is needed between the required and allowable drilling fluid pressure thresholds based on the known geotechnical conditions to allow for reacting to downhole pressure spikes prior to including an inadvertent drilling fluid return.

While predictions can be made to determine the required and allowable drilling fluid pressures where the highest risk of an inadvertent return may exist, these evaluations assume an open flow pathway from the source of the drilling fluids (bit or reamer assembly) to the HDD entry/exit location. If a blockage were to develop within the HDD bore during an installation, this blockage could eliminate or reduce the open flow pathway back to the HDD entry/exit location resulting in an increase in downhole fluid pressures. Blockages can occur when drilling through geotechnical materials that do not remain stable behind the drill bit/reamer assembly or in soils that may not have been conditioned during the passage of the drilling assembly past the formation.

Downhole annular drilling fluid pressures shall be continuously monitored during pilot bore drilling and compared to predicted magnitudes and established allowed pressure thresholds. The contractor will be required monitor their downhole annular pressures and response quickly to unanticipated fluid pressure spikes to maintain drilling pressures as low as possible. To help clean the drilled bore from a build-up of cuttings, the drill bit and reamer assemblies will be pulled back up onto the drill rig to swab the bore after each new joint of pipe is completed.

Drilling operations will be halted by the drill rig operators immediately upon detection of a significant drop in drilling pressure and corresponding loss in drilling fluid returns or following other evidence of an inadvertent return. The clean-up of all spills shall begin immediately. Management and safety departments shall be notified immediately of any spills and shall be consulted regarding clean-up procedures. A spill kit shall be on-site and used if an inadvertent return occurs. Containment materials, such as straw bales, shall also be on-site prior to and during all operations.

Columbia will only use Contractors that specialize in HDD to perform the proposed stream and wetland crossings. Columbia is responsible for the supervision of the drilling contractor and retains the right to shut down operations. Columbia will require that the HDD contractor formalize and provide an inadvertent release work plan prior to commencing any field activities.

Columbia will provide on-site visual monitoring of the construction area during construction operations and will provide a designated environmental inspector (EI). Columbia's will visually monitor the North Branch of the Potomac River from boat or drone during all HDD drilling operations under the river to visually monitor for inadvertent releases. Additionally, Columbia will ensure a vacuum truck shall be staged at the HDD work pad. The vacuum truck would be mobilized immediately upon the discovery of an inadvertent return event.

2.2 INADVERTENT RETURN RESPONSE PLAN

The risk of an inadvertent return is greatest during the pilot bore phase of the installation process. The highest risk occurs near the HDD entry and exit locations where the depth of cover is lowest. Monitoring of the downhole drilling fluid pressures during the pilot bore and reacting to pressure spikes often reduces the risk of an inadvertent drilling fluid return. These reactions can include reducing drilling fluid flow, reducing forward advancement, and/or tripping back several drill pipes to clear any blockage that may have developed behind the drill pipe.

Visual monitoring of the HDD alignment will be performed during daylight hours under the North Branch of the Potomac River from a boat or by drone during all HDD operations under the river.

If an inadvertent return is detected, the drilling crew shall take immediate corrective action. Corrective actions shall include:

- Immediately shutting off pumps supplying drilling fluids to remove the source producing the inadvertent return. Drilling fluids will continue to flow to the site of the inadvertent return until the downhole pressure reduces/bleeds off.

- Containment measures will be employed to prevent further flow of the inadvertent return. Photographs will be taken to document the size and volume of the inadvertent return.

- Once containment measures are in place, the drill rig operator will trip back several drill pipes (with no to low drilling fluids pumped downhole) to determine if a blockage developed behind the drill bit. Drilling fluid flow will be introduced slowly with visual inspection that full returns are observed at the HDD entry location. If full returns are noted, the drill rig operator will slowly advance forward past the location of the inadvertent return.

There is greater potential for an inadvertent return at the entry and exit locations. In the contingency planning for the pipeline crossing, inadvertent returns at the entry and exit locations have been considered and the following preventive actions have been developed:

- The entry and exit locations on all directionally drilled crossings shall have dry (upland) land segments where an inadvertent return can be easily detected, contained, and remediated.

- To isolate and contain a potential inadvertent return at each of the drill sites, there must be a berm around the downslope side of the drilling rig set-up area. Hay bales or silt fence must be part of the berm on the resource side of the drilling area (see appropriate Erosion and Sediment Control Plans).

- A spill kit will be on site and utilized if an inadvertent return should occur. All equipment and materials necessary for containment and cleanup of inadvertent returns shall be on site and accessible always.

- If necessary, barriers (such as straw bales or sedimentation fences) between the bore site and the edge of the water source shall be constructed prior to drilling, to prevent released bentonite material from reaching the water.

If an inadvertent return is detected, and occurs outside of the Project's approved workspace, Columbia's construction contractor will implement all of the above corrective actions immediately. The Chief Inspector and/or Columbia's EI will then notify the Columbia U.S. Environmental Planning and Permitting Principal so they can notify the appropriate resource agencies. All agency notifications will occur within 24 hours and proper documentation will be accomplished in a timely and complete manner.

2.2.1 In the event of an inadvertent return in an Upland Area, the following corrective actions will be taken immediately:

- The source/pumps will be stopped temporarily or the pressure will be decreased.

- Drilling crew will monitor (walk) the HDD alignment to determine if an inadvertent return has occurred. Monitoring will include visual inspection 200 feet on either side of the HDD alignment.

- Upon discovery of an inadvertent return, the size, location, and estimated quantity will be determined and recorded for reporting purposes. Photographs will be taken showing the inadvertent return from several different angles prior to and following clean-up.

- The inadvertent return will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits.

- The drilling fluid will be removed from the ground surface to the greatest extent possible and removed from the site using manual equipment such as shovels and wheel barrows or earth-moving equipment such as backhoes or small bulldozers, portable pumps and/or vacuum trucks.

- The affected areas will be restored within 30 days as closely as possible to their previous condition.

- Documentation must be made and maintained by the contractor and provided to Columbia.

- The Contractor must follow any special instructions from Columbia's EIs.

2.2.2 In the event of an inadvertent return into wetlands and/or waterbodies, the containment and corrective actions described below must be taken immediately and the Contractor must make the appropriate contacts in accordance with Section 2.2.2 below.

- The source/pumps will be stopped temporarily or the pressure will be decreased.

- Drilling crew will visually inspect wetland and waterbodies for the presence of an inadvertent return.

- Upon discovery of an inadvertent return, the size, location, and estimated quantity will be determined and recorded for reporting purposes. Photographs will be taken showing the inadvertent return from several different angles prior to and following clean-up.

- If possible, the inadvertent return will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits (do not construct earthen dikes or berms within wetland or stream areas).

- The drilling fluid will be removed from the ground surface and from the site to the greatest extent possible by manual means such as by use of shovels, wheelbarrows and/or vacuum hoses. Earth moving equipment such as backhoes or small bulldozers will be used only if manual means prove to be impractical and only after appropriate measures have been taken to minimize impacts to the resource. These measures will be authorized by Columbia's EI.

- The affected areas will be restored as closely as possible to their previous condition.

- If the inadvertent return is within a waterbody, clean-up measures will be evaluated based on the extent and accessibility of the accumulated residue and the potential environmental effects associated with clean-up operations. In certain cases, recovery and clean-up of drilling mud inadvertently released into flowing water will not be practical as recovery measures may potentially have greater impact to the environment than allowing the inert, water soluble drilling fluid to dissipate naturally.

- If in-water clean-up measures are deemed necessary, a plan will be drafted and submitted for approval by the affected agency. The measure may include, but are not limited to:

    - Deployment of divers with suction hoses to remove polled bentonite from floor of waterbody
    - Deployment of boats with mechanical/skimming equipment
    - Hand-removal of bentonite
    - Deployment of turbidity curtains
    - Deployment of sediment collectors

- In the event of an inadvertent release of drilling fluid or a pollution event occurs in the North Branch of the Potomac River, Columbia will provide water quality monitoring downstream from the release until water quality satisfies the requirements of COMAR 26.08.02 for a Use 1 stream or match the levels found immediately upstream from the release.

- Resuspension of bentonite and controlling the in-situ turbidity of the waterbody will be primary considerations.

- Documentation must be made and maintained by the contractor and provided to Columbia's EI.

- The Contractor must follow any special instructions from Columbia's EI.

Typically, drilling activities will not be suspended unless the inadvertent return creates a threat to public health and safety or unless suspended by Columbia or a regulatory agency.

2.3 Response and Reporting Personnel

If an inadvertent return of drilling fluids is detected, the drilling contractor will immediately notify Columbia's EI and Chief Inspector. The EI has been given "stop work authority" by Columbia and his/her instructions must be followed.

In addition to the EI and Chief Inspector, Columbia will have an Independent Environmental Monitor that reports directly to the Maryland Department of the Environment (MDE) Administrative Compliance Program to ensure compliance with the MDE permit requires and will be onsite during HDD construction activities.

Chief Inspector/EI Responsibilities:

The Chief Inspector and/or EI have overall responsibility for implementing this Plan. The Chief Inspector/EI will ensure that all employees are trained prior to drilling activities. The Columbia U.S.

Environmental Planning and Permitting Principal shall be notified immediately when an inadvertent return is detected. They will be responsible for ensuring Columbia's environmental health department is aware of the inadvertent return, coordinating appropriate personnel, response, cleanup, regulatory agency notification and coordination to ensure proper clean-up, disposal of recovered material and timely reporting of the incident. They shall ensure waste materials are properly containerized, labeled, and removed from the site to an approved disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.

The Chief Inspector and/or EI shall be familiar with all aspects of the drilling activity, the contents of this Plan, and the conditions of approval under which the activity is permitted to take place. They shall have stop work authority and commit the resources (personnel and equipment) necessary to implement this Plan. They shall assure that a copy of this Plan is available (onsite) and accessible to all construction personnel. They shall ensure that all workers are properly trained and familiar with the necessary procedures for response to an inadvertent return, prior to commencement of drilling operations.

2.4 Training

Prior to the commencement of drilling activities, the Chief Inspector and/or Columbia's EI shall ensure that the contractors receive training in the following:

- The provisions of this Plan, equipment maintenance and site-specific permit and monitoring requirements;
- Inspection procedures for release prevention and containment equipment and materials;
- Contractor obligation to immediately stop the drilling operation upon first evidence of the occurrence of an inadvertent return and to immediately report any releases;
- Contractor responsibilities in the event of an inadvertent return of drilling materials;
- Operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and
- Protocols for communication with agency representatives who maybe on-site during the clean-up effort.

The Chief Inspector and/or Columbia's EI shall ensure that a job briefing meeting is held at the start of each day of drilling to review the appropriate procedures to be followed in case of an inadvertent return or to advise new hires. Questions will be answered and clarification given on any point over which the drilling crew or other Project staff has concerns.

2.5 Response Equipment

The drilling contractor will be responsible for having all response materials and equipment required for containment and remediation of an inadvertent return. Such materials must be stored within the drilling sites.

The materials should include at a minimum: lumber for temporary shoring, equipment mats, sand, portable pumps, hand tools, and hay bales and silt fence. The drilling contractor will also have heavy equipment such as backhoes available, which can be utilized to control and clean up large inadvertent returns.

The Chief Inspector and/or Columbia's EI shall ensure that:

- All equipment and vehicles are checked and maintained daily to prevent leaks of hazardous materials;
- Spill kits and spill containment materials are available on-site always and that the equipment is in good, working order;
- Equipment required to contain and clean up an inadvertent return release will either be available at the work site or readily available at an offsite location within a reasonable distance from the drilling activities; and
- If equipment is required to be operated near a waterbody, absorbent pads and/or secondary containment structures shall be used as necessary to protect the waterbody or wetland from engine fluids.

2.6 Follow-Up

After the inadvertent return, has been contained, the drilling contractor and Columbia will make every effort to determine the root cause of the inadvertent return. Columbia will amend the HDD procedures to control the factors which caused the inadvertent return and to minimize the chance of recurrence. Developing the corrective measure will be the joint effort of Columbia and the drilling contractor.

In some cases, the corrective measure may involve a determination that the existing hole encountered a void, which could be bypassed with a slight change in profile. In other cases, it may be determined that the existing hole encountered a zone of unsatisfactory soil material and the hole may have to be abandoned. Any such activity must be documented by the contractor and Columbia.

2.6.1 Response Close-out Procedures

When the release has been contained and cleaned up, response closeout activities will be conducted at the direction of the Chief Inspector/ Columbia's EI and shall include the following:

- The recovered drilling fluid will either be recycled or hauled to an approved facility for disposal. No recovered drilling fluids will be discharged into streams, storm drains or any other water source;
- All inadvertent return excavation and clean-up sites will be returned to pre-construction contours using clean fill, as necessary;
- Columbia will restore to preconstruction conditions any impacts to existing infrastructure or residential buildings that may have occurred as the result of the inadvertent return; and
- All containment measures (fiber rolls, straw bales, etc.) will be removed, unless otherwise specified by the Chief Inspector and/or Columbia's EI.

2.6.2 Construction Restart

For small releases not requiring external notification, drilling may continue if 100 percent containment has been achieved through the use of a leak stopping compound or redirection of the bore and the

cleanup crew remains at the site throughout the construction period.

For releases requiring external notification related to an inadvertent release of drilling mud, construction will not restart without prior approval.

3.1 NOTIFICATION

Prior to commencing HDD construction, Columbia will notify and coordination construction access and/or any potential disruptions to the McCoole FMA with Alan Klotz of the Maryland Department of Natural Resources at (240) 215-5676. Additionally the MDE Compliance Division will be notified of any inadvertent release even if it is not in the state of Maryland, but impact waters of the State of Maryland.

In the event of an inadvertent return that reaches a water source, the Chief Inspector and/or Columbia's EI will notify the Columbia U.S. Environmental Planning and Permitting Principal so they can notify the appropriate resource agencies. All agency notifications will occur within 24 hours and proper documentation will be accomplished in a timely and complete manner. Columbia will identify all downstream public drinking water intake facilities and maintain a list of emergency contact numbers. In the event of an inadvertent release, Columbia willl notify any potentially affected downstream public drinking water intake facilities immediately.

The following information will be provided:

- Name and telephone number of person reporting;
- Location of the release;
- Date and time of the release;
- Type and quantity, estimated size of release;
- How the release occurred;
- The type of activity that was occurring around the area of the release;
- Description of any sensitive areas, and their location in relation to the release;
- Description of the methods used to clean up or secure the site; and
- Listing of the current permits obtained for the Project.

3.2 Communicating with Regulatory Agency Personnel

All employees and contractors will adhere to the following protocols when permitting Regulatory Agency Personnel arrive on site. Regulatory Agency personnel will be required to comply with appropriate safety rules. Only the Columbia U.S. Environmental Planning and Permitting Principal or their designated EI are to coordinate communication with Regulatory Agency personnel.

3.3 Landowner Notifications

Columbia will notify all affected landowners that may be impacted by HDD construction operations and/or an inadvertent return prior to starting any work. The notification will include details regarding construction timing and duration, potential issues they may experience, as well as Columbia's landowner inquiry hotline (888) 499-3450, that is available to report any concerns during construction. If an inadvertent release of drilling fluid is detected, landowners should call the

Columbia Monitoring Center immediately at 1-800-835-7191.

4.0 Failed HDD Installation

While not anticipated, if an attempted HDD installation is unsuccessful, the proposed HDD alignment could be modified beneath the River using the same general location to accommodate an additional HDD attempt, depending on the condition that resulted in the HDD failure.

Prior to attempting a second HDD crossing, a risk mitigation workshop should be held with all parties to determine the cause of the initial failure and any mitigation measure that could be adopted to reduce the risk(s) during the second HDD attempt.

Potential causes that may lead to a failed HDD installation include:

- Stuck or damaged product pipe during pullback operations. The risk is mitigated by:
  - Completing swab pass or passes to gauge the condition of the HDD bore by evaluating the drill rig effort required to pull tooling through the HDD bore;
  - Only commencing pullback operations after verification that the bore is adequately conditioned; and
  - Minimizing the amount of downtime associated with delays during pullback operations.
- Bore instability/collapse. The risk is mitigated by:
  - Designing the HDD profile in favorable ground materials along the alignment that are not amenable to raveling causing collapse of the bore.
- Excess loss of drilling fluids and inability to remove cuttings from the bore. This risk is mitigated by:
  - Designing the HDD profile in favorable ground materials along the alignment;
  - Evaluating the required and allowable drilling fluid pressures for the installation and providing sufficient separation between the required and allowable drilling fluid pressures; and
  - Incorporating temporary casing pipe to support shallow soils.

If an open HDD bore could not be advance and abandonment where required, the bore would be grouted with a cement-based material to fill the excavation and minimize risks of a potential groundwater flow pathway.

If an HDD installation were completed and the installed pipe was damaged to the point it could not be used for its intended purpose, the inside of the steel product pipe would be grouted with a cement based grout and the annular space around the pipe would be grouted for approximately 200 feet at each HDD entry and exit location.

In addition, any additional requirement set forth in permits acquired for a specific HDD installation will be met in terms of abandonment. Columbia will consult with the appropriate permitting and regulatory agencies, including FERC prior to the abandonment of the HDD bore and/or the installation of the pipe via other alternative crossing methods.

Columbia Pipeline Group

Attachment 1

Material Data Safety Sheet for Bentonite (Drilling Fluid)

MATERIAL SAFETY DATA SHEET

Product Trade Name: **BARA-KADE® BENTONITE**

Revision Date: 31-Mar-2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: BARA-KADE® BENTONITE
Synonyms: None
Chemical Family: Mineral
Application: Additive

Manufacturer/Supplier

BPM Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032

Telephone: (281) 871-7900
Fax: (281) 871-7940
Emergency Telephone: (800) 666-9260 or (713) 753-3000

Prepared By

Chemical Compliance
Telephone: 1-580-251-4335

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE	CAS Number	PERCENT	ACGIH TLV-TWA	OSHA PEL-TWA
Crystalline silica, cristobalite	14464-46-1	0 - 1%	0.05 mg/m^3	1/2 x $\frac{10\ mg/m^3}{\%SiO2 + 2}$
Crystalline silica, tridymite	15468-32-3	0 - 1%	0.05 mg/m^3	1/2 x $\frac{10\ mg/m^3}{\%SiO2 + 2}$
Crystalline silica, quartz	14808-60-7	1 - 5%	0.05 mg/m^3	$\frac{10\ mg/m^3}{\%SiO2 + 2}$
Bentonite	1302-78-9	60 - 100%	Not applicable	Not applicable

More restrictive exposure limits may be enforced by some states, agencies, or other authorities.

3. HAZARDS IDENTIFICATION

Hazard Overview	**CAUTION! - ACUTE HEALTH HAZARD** May cause eye and respiratory irritation. **DANGER! - CHRONIC HEALTH HAZARD** Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease. This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposures below recommended exposure limits. Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product. Review the Material Safety Data Sheet (MSDS) for this product, which has been provided to your employer.

4. FIRST AID MEASURES

Inhalation	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Skin	Wash with soap and water. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Ingestion	Under normal conditions, first aid procedures are not required.
Notes to Physician	Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flash Point/Range (F):	Not Determined
Flash Point/Range (C):	Not Determined
Flash Point Method:	Not Determined
Autoignition Temperature (F):	Not Determined
Autoignition Temperature (C):	Not Determined
Flammability Limits in Air - Lower (%):	Not Determined
Flammability Limits in Air - Upper (%):	Not Determined

Fire Extinguishing Media	All standard firefighting media.
Special Exposure Hazards	Not applicable.
Special Protective Equipment for Fire-Fighters	Not applicable.
NFPA Ratings:	Health 0, Flammability 0, Reactivity 0
HMIS Ratings:	Flammability 0, Reactivity 0, Health 0*

6. ACCIDENTAL RELEASE MEASURES

Personal Precautionary Measures	Use appropriate protective equipment. Avoid creating and breathing dust.
Environmental Precautionary Measures	None known.
Procedure for Cleaning / Absorption	Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. HANDLING AND STORAGE

Handling Precautions

This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.

Storage Information

Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in Section 2.

Respiratory Protection

Wear a NIOSH certified, European Standard EN 149, or equivalent respirator when using this product.

Hand Protection

Normal work gloves.

Skin Protection

Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection

Wear safety glasses or goggles to protect against exposure.

Other Precautions

None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Solid
Color:	Various
Odor:	Odorless
pH:	8-10
Specific Gravity @ 20 C (Water=1):	2.65
Density @ 20 C (lbs./gallon):	Not Determined
Bulk Density @ 20 C (lbs/ft3):	50-70
Boiling Point/Range (F):	Not Determined
Boiling Point/Range (C):	Not Determined
Freezing Point/Range (F):	Not Determined
Freezing Point/Range (C):	Not Determined
Vapor Pressure @ 20 C (mmHg):	Not Determined
Vapor Density (Air=1):	Not Determined
Percent Volatiles:	Not Determined
Evaporation Rate (Butyl Acetate=1):	Not Determined
Solubility in Water (g/100ml):	Insoluble
Solubility in Solvents (g/100ml):	Not Determined
VOCs (lbs./gallon):	Not Determined
Viscosity, Dynamic @ 20 C (centipoise):	Not Determined
Viscosity, Kinematic @ 20 C (centistrokes):	Not Determined
Partition Coefficient/n-Octanol/Water:	Not Determined
Molecular Weight (g/mole):	Not Determined

10. STABILITY AND REACTIVITY

Stability Data: Stable

Hazardous Polymerization: Will Not Occur

Conditions to Avoid	None anticipated
Incompatibility (Materials to Avoid)	Hydrofluoric acid.
Hazardous Decomposition Products	Amorphous silica may transform at elevated temperatures to tridymite (870 C) or cristobalite (1470 C).
Additional Guidelines	Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure	Eye or skin contact, inhalation.
Inhalation	Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A). Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).
Skin Contact	May cause mechanical skin irritation.
Eye Contact	May cause eye irritation.
Ingestion	None known
Aggravated Medical Conditions	Individuals with respiratory disease, including but not limited to asthma and bronchitis, or subject to eye irritation, should not be exposed to quartz dust.
Chronic Effects/Carcinogenicity	Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis. Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2). There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

Other Information For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung Association, American Journal of Respiratory and Critical Care Medicine, Volume 155, pages 761-768 (1997).

Toxicity Tests

Oral Toxicity: Not determined

Dermal Toxicity: Not determined

Inhalation Toxicity: Not determined

Primary Irritation Effect: Not determined

Carcinogenicity Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997).

Genotoxicity: Not determined

Reproductive / Developmental Toxicity: Not determined

12. ECOLOGICAL INFORMATION

Mobility (Water/Soil/Air) Not determined

Persistence/Degradability Not determined

Bio-accumulation Not Determined

Ecotoxicological Information

Acute Fish Toxicity: TLM96: 10000 ppm (Oncorhynchus mykiss)
Acute Crustaceans Toxicity: Not determined
Acute Algae Toxicity: Not determined

Chemical Fate Information Not determined

Other Information Not applicable

13. DISPOSAL CONSIDERATIONS

Disposal Method Bury in a licensed landfill according to federal, state, and local regulations.

Contaminated Packaging Follow all applicable national or local regulations.

14. TRANSPORT INFORMATION

Land Transportation

DOT
Not restricted

Canadian TDG
Not restricted

ADR Not restricted

Air Transportation

ICAO/IATA Not restricted

Sea Transportation

IMDG
Not restricted

Other Shipping Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory	All components listed on inventory.
EPA SARA Title III Extremely Hazardous Substances	Not applicable
EPA SARA (311,312) Hazard Class	Acute Health Hazard Chronic Health Hazard
EPA SARA (313) Chemicals	This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).
EPA CERCLA/Superfund Reportable Spill Quantity For This Product	Not applicable.
EPA RCRA Hazardous Waste Classification	If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.
California Proposition 65	The California Proposition 65 regulations apply to this product.
MA Right-to-Know Law	One or more components listed.
NJ Right-to-Know Law	One or more components listed.
PA Right-to-Know Law	One or more components listed.

Canadian Regulations

Canadian DSL Inventory	All components listed on inventory.
WHMIS Hazard Class	D2A Very Toxic Materials (Crystalline silica)

16. OTHER INFORMATION

The following sections have been revised since the last issue of this MSDS
Not applicable

Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Material Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

Disclaimer Statement

This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

*****END OF MSDS*****

REDMOND MINERALS, INC.

SAFETY DATA SHEET

Product Code: AB3A005 (BENTONITE)
Updated: 12/23/14

SECTION 1: IDENTIFICATION

PRODUCT NAME(s):	Swell Clay, Pond Seal, Conditioner		
GENERIC NAME:	Bentonite	**MSDS CODE NO.**	A202PABA005
SYNONYMS:	Calcium Bentonite, Sodium Bentonite, Montmorillonite, Smectite Clay		
CHEMICAL NAME:	Sodium / Calcium Aluminum Silicate	**CASE REGISTRY NO.**	1302-78-9
MANUFACTURING ADDRESS:	Western Clay Company 620 East SR 24 Aurora, UT 84620	**CONTACT NUMBERS:**	Emergency: 435-657-3605 Redmond Minerals: 435-529-7402
DISTRIBUTOR ADDRESS:	Redmond Minerals, Inc. 2725 North 100 West Redmond, UT 84652		
RECOMMENDED USE:	Bentonite has a variety of uses. It can be used as a rheology modifier, binding agent, absorbent, filler and other i.e. for applications like: foundry, iron ore agglomeration, drilling, construction - civil engineering, filtration (i.e. oil, wine, beer), pharmaceutical and cosmetics, cat litter, food processing aids and feed additives.		
USE RESTRICTIONS:	There are no identified uses advised against.		

SECTION 2: HAZARD IDENTIFICATION

GHS CLASSIFICATION

Signal: Danger
Causes damage to the lungs through prolonged or repeated exposure if inhaled

HEALTH/PHYSICAL HAZARDS:

Material dusts containing less than 1% free crystalline silica (quartz) are classified as nuisance particulates. Exposure to these dusts may cause irritation to eyes, ears, throat, and upper respiratory tract. This materials dust may contain more than 1% free silica as Quartz. Chronic (long tenn) exposure to air born free silica at levels higher than TLV=s may lead to the development of silicosis or other respiratory problems. (See Section VI)

HAZARD LISTING:

Nuisance Particles are listed by ACGIH. Free Crystalline Silica as Quartz is listed by OSHA and ACGIH as a Hazardous Material.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCES:	CAS #	Percent (w/w)
Bentonite	1302-78-9	80-100%
Crystalline silica, quartz	14808-60-7	0-5%
Crystalline silica, cristobalite	14464-46-1	0-1%
Crystalline silica, tridymite	15468-32-3	0-1%
Water	7732-18-5	8-12%

SECTION 4: FIRST AID MEASURES

INHALATION:	If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
SKIN:	Wash with soap and water. Get medical attention if irritation persists.
EYES:	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
INGESTION:	Under normal conditions, first aid procedures are not required.

NOTES TO PHYSICIAN:	Treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT RANGE:	Non-flammable Silicate Mineral	**FLAMMABLE LIMITS:**	LEL: NA UEL:NA
FIRE EXTIGUISHING MEDIA:	All standard firefighting media	**SPECIAL EXPOSURE HAZARDS:**	Not Applicable
NFPA RATINGS:	Health 0, Flammability 0, Reactivity 0	**HMIS RATINGS:**	Health 0*, Flammability 0, Reactivity 0, PPE: At
SPECIAL FIRE FIGHTING PROCEDURES:	Not applicable		

SECTION 6: ACCIDENTAL RELEASE MEASURES

MATERIAL SPILL OR RELEASE:	Avoid breathing dust; wear respirator approved for silica veering dust. Vacuum up to avoid generating airborne dust. Avoid using water. Product is slippery when wet.
WASTE DISPOSAL METHOD:	Product should be disposed of in accordance with applicable local, state, and federal regulations. There are no known environmental precautionary measures. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage, and disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING PRECAUTIONS:	This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposer limits below permissible limits. Material is slippery when wet.
STORAGE INFORMATION:	Do not reuse empty container. Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Keep from excessive heat.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

VENTILATION REQUIREMENTS:	Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits listed in section VI.
RESPIRATOR:	Use respirator approved by NIOSH/MSHA for silica bearing dust.
EYE PROTECTION:	Use safety glasses or goggles to protect against exposure.
HAND PROTECTION:	Normal work gloves.
SKIN PROTECTION:	Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.
OTHER PPE:	None known.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:	powder	**COLOR:**	Tan, Light Green, Red
BULKING VALUE:	90 lbs.	**DENSITY:**	70 lb/ft^3 powder or compact granular
MELTING POINT:	1450 ^oC	**pH:**	8-10
SOLUBILITY IN WATER:	Insoluble, Forms Colloidal Suspension	**ODOR:**	Mild earthy

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable	**HAZARDOUS POLYMERIZATION:**	None
INCOMPATIBILITY:	None	**HAZARDOUS DECOMPOSITION PRODUCTS:**	None

SECTION 11:TOXICOLOGICAL INFORMATION

TOXICITY TESTS:

Oral	ND	Genotoxicity	ND
Dermal	ND	Reproductive	ND
Inhalation	ND	Primary Irritation Effect	ND

PRINCIPLE ROUTE OF EXPOSURE: Eye or skin contact, inhalation

SKIN: Possible dying resulting in dermatitis

EYES: Mechanical irritant

INGESTION: Accidentally this material will generally cause no adverse effects. Minor intestinal irritation is possible.

INHALATION: (Acute, Short Term) Exposure to excessive concentrations of dust may cause irritation of the Nose, Throat, and Upper Respiratory Tract. (Chronic, Long Term) Chronic exposure to crystalline silica such as quartz where levels exceed TLV=s can cause Silicosis and other respiratory problems. Short term exposure to very high concentrations may lead to increased risk and accelerated onset of silicosis and respiratory damage. Silicosis is a progressive, degenerative, disabling, and sometimes fatal lung disease characterized by coughing, shortness of breath, wheezing, and fibrotic changes in the lungs with scarring and nodular formation.

PERMISSIBLE EXPOSURE LIMITS:
(For air contaminants 8 hour TWA)

Bentonite as Nuisance Dust	OSHA PEL	ACGIH TLV
Total Dust	15mg/m^3	Not determined
Respirable Dust	5mg/m^3	Not determined
Crystalline Quartz (respirable)	0.1mg/m^3	0.1mg/m^3

CARCINOGENICITY: Bentonite is not listed by NTP, IARC, or OSHA. The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans, and experimental evidence that tridymite as a carcinogen in animals. The National Toxicology Program (NTP) classifies respirable crystalline silica as "Known to be a human carcinogen".

SECTION 12: ECOLOGICAL INFORMATION

MOBILITY (water/soil/air):	ND	**FISH TOXICITY:**	TLM96: 10000 ppm (Oncorhynchus mykiss)
PERSISTENCE/DEGRADABILITY:	ND	**CRUSTACEANS TOXICITY:**	ND
BIO-ACCUMULATION:	ND	**ALGAE TOXICITY:**	ND
CHEMICAL FATE INFORMTION:	ND	**OTHER INFORMATION:**	ND

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Product should be disposed of in accordance with applicable local, state, and federal regulations. There are no known environmental precautionary measures. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage, and disposal.

SECTION 14: TRANSPORTATION INFORMATION

SHIPPING NAME: Common Ground Clay (NOIBN) **HAZZARD CLASS:** Not Hazardous **CAUTIONARY LABELING:** None required

LAND TRANSPORTATION RESTRICTIONS: **DOT:** Not Restricted **CANADIAN TDG:** Not Restricted **ADR:** Not Restricted

AIR TRANSPORTATION RESTRICTIONS: **ICAO / IATA:** Not Restricted

SEA TRANSPORTATION RESTRICTIONS: **IMDG:** Not Restricted

Columbia Pipeline Group

Spill Prevention, Control, and Countermeasure Plan

For Construction Activities

This document contains information on spill prevention and control methods that Columbia Gas Transmission LLC (Columbia) has used successfully in the past. This plan is comprehensive in that it includes actions used to prevent spills, in addition to specifying actions that will be taken to address any spills that occur. The Project's on-site Chief Inspector and/or Environmental Inspector are responsible for ensuring the Contractors implement and maintain spill control measures.

This plan will be updated by Construction Contractor to reflect actual site conditions and practices.

A complete and updated copy of this plan will be accessible on the project site at all times.

Prepared by:
Jason Chambers
Environmental Compliance Coordinator
1700 MacCorkle Ave., SE
Charleston, WV 25314
304.357.2965

Columbia Pipeline Group

I. Responsible Personnel

Below are the names, titles, and contact information for the personnel responsible for implementing and updating the SPCC Plan.

Responsibility	Name and Title	Contact Information
Implementing and Updating SPCC Plan – Primary Person		Company: Office Phone: Cell Phone:
Implementing and Updating SPCC Plan – Secondary Person		Company: Office Phone: Cell Phone:

II. Spill Reporting

In the event of a spill, the Contractor will notify

A) The Chief Inspector and/or Environmental Inspector

B) Monitoring Center – 1-800-835-7191

C) National Response Center – 1-800-424-8802
(If Monitoring Center does not respond within 30 minutes)

In accordance with Columbia policies, plans, and procedures (Plan Number 120.02.01), **Columbia's Environmental Health and Safety Department is responsible for contacting** all appropriate agencies.

Columbia Pipeline Group

III. Preventative Measures

Spills of any amount of petroleum products or hazardous materials are to be prevented. The following preventative measures will be followed to help avoid spills and minimize the impact of spills:

A) Bulk quantities up to 5,000 gallons of diesel fuel and 5,000 gallons of gasoline will be stored in one location (the fuel depot) for the Project. Adequate spill containment measures, such as containment dikes, combined with impervious lining will be installed before fuel storage tanks are filled, and will be maintained throughout the Project. Bulk quantities of hazardous liquids (e.g., solvents and lubricants) will be stored at the fuel depot locations.

B) Fuel can be stored at the equipment staging areas and as much equipment as practical will be refueled there. Any equipment that must be refueled in the field will be fueled from tanks carried to the work site. Fuel carriers (greater than 110 gallons capacity) will not be permitted to cross wetlands or ford water bodies. Equipment refueling will not be performed within 100 feet of any body of water or wetland except by hand-carried cans (5 gallon maximum capacity) when necessary. If construction equipment must be refueled within 100 feet of a water body, the Environmental Inspector will update this SPCC plan, based on specific on-site field conditions, to protect these resources. Care will be taken during refueling not to overfill or spill fuel onto the housing of equipment.

C) Lesser quantities of fuel (up to 500 gallons) and solvents and lubricants (e.g., motor oils, hydraulic fluid) may be stored along the construction work area as necessary to service equipment used on the Project (quantities vary depending on the size of the construction spread being used), provided that this storage does not conflict with other parts of this plan. Sorbent booms and clean-up kits will be kept at all storage locations and will be readily available at all times.

D) All fuel storage areas will be located at least 100 feet from streams, ponds, or wetlands; at least 200 feet from active private water wells, and at least 400 feet from municipal water wells, unless using an operational fuel storage area established on Columbia property. All fuel storage areas will not be located within any designated municipal watershed area (except at locations designated for these purposes by an appropriate governmental authority): Equipment servicing, lubricating and refueling will also be in accordance with these requirements whenever possible (i.e., except when stationary equipment such as drilling rigs is being used). Where these conditions cannot be met, the Environmental Inspector will update this SPCC plan, based on specific on-site field conditions, to protect these resources.

Columbia Pipeline Group

E) Use of hazardous materials for vehicle maintenance will follow the same requirements mentioned above for equipment refueling. Impervious or sorbent materials will be placed under the work area before the work begins. Additional sorbent materials will also be readily available. Waste materials created during maintenance (e.g., used oil) will be collected for proper disposal. The work site and the vehicle will be checked by a Columbia inspector after the maintenance work is complete to ensure that all hazardous materials are properly contained. All waste material, including partially used or empty containers, discarded parts, clean up rags, and used sorbent materials, as well as discarded hazardous materials containers (e.g., oil cans, grease tubes), will be collected for proper disposal.

F) All motor fuel, lube oil, chemicals, and other polluting substances will be tightly sealed and clearly labeled during transportation and storage.

G) Fuel trucks, pumps, mechanics' vehicles, the contractor's foremen's vehicles and Columbia Inspectors' vehicles will be equipped with appropriate sized spill kits containing absorbent materials approved for petroleum products and have sufficient tools and material to stop leaks.

H) Construction equipment will not be washed in any body of water or wetland, nor will runoff resulting from washing operations be permitted to directly enter any body of water or wetland area.

I) Construction equipment, vehicles, materials, hazardous materials, chemicals, fuels, lubricating oils, and petroleum products will not be parked, stored, or serviced within 100 feet of all bodies of water and wetlands.

J) All equipment will be checked, by a Columbia inspector, daily for leaks prior to beginning work in bodies of water or wetlands. Steps will be taken to repair leaks or remove the equipment from service, if necessary.

If barge mounted equipment is to be employed, the contractor will develop specific spill-prevention plans to be reviewed and approved by Natural Resource Permitting group.

Columbia Pipeline Group

IV. Impact Minimization Measures

If a spill should occur, Columbia will ensure immediate action is taken to minimize the impact of the spill, and see that appropriate cleanup action is immediately undertaken.

In the event of a spill into or in the vicinity of bodies of water or wetlands, the following will occur immediately:

A) The source will be immediately stopped

B) The spill will be contained by placing sorbent booms or constructing dikes

C) The spill will be collected with sorbent materials, skimmed off water surfaces with booms, and/or the contaminated soil will be excavated

D) The waste materials will be properly stored and disposed in accordance with Columbia policy.

The affected areas will be restored as closely as possible to their previous condition.

If the spill is such that Columbia personnel or the on-site contractor cannot immediately and effectively respond, Columbia's environmental contractor, who specializes in spill cleanup, will be employed.

Appropriately sized spill kits will be maintained in close proximity to hazardous material storage areas and equipment. These kits will be immediately accessible to all Project employees. The table below includes the type(s) and location(s) of spill kits.

Spill Kit Type(s)	Spill Kit Location(s)

Columbia Pipeline Group

V. Project and Site Information

This section is to be completed with project specific information.

A) Project Scope:

B) Nearby waterways and sensitive areas:

C) Map of project showing location, boundaries, and waterways/wetlands (Attached)

Columbia Pipeline Group

VI. Potential Spill Sources

The table below identifies each hazardous material brought to or generated on-site. These potential pollutants include materials used for operating, refueling, maintaining, and cleaning all equipment, as well as fertilizers, pesticides, etc.

Hazardous Material	Intended Use	Estimated Amount On-site	Use and Storage Location	Distance from Waterway/Sensitive Area
Fuels				
Batteries				
Lubricants				
Parts Cleaners				
Fertilizer/Lime				
Other				

Columbia Pipeline Group

VII. Pre-Existing Contamination

Description provided below if any pre-existing contamination exists. This space is left blank if not applicable.

VIII. Training

The Contractor will instruct personnel on the operation and maintenance of equipment to prevent spillage of fuel, oil, lubricants, or other potential pollutants previously listed. Personnel will also be made aware of the pollution control laws, rules, and regulations applicable to their work.

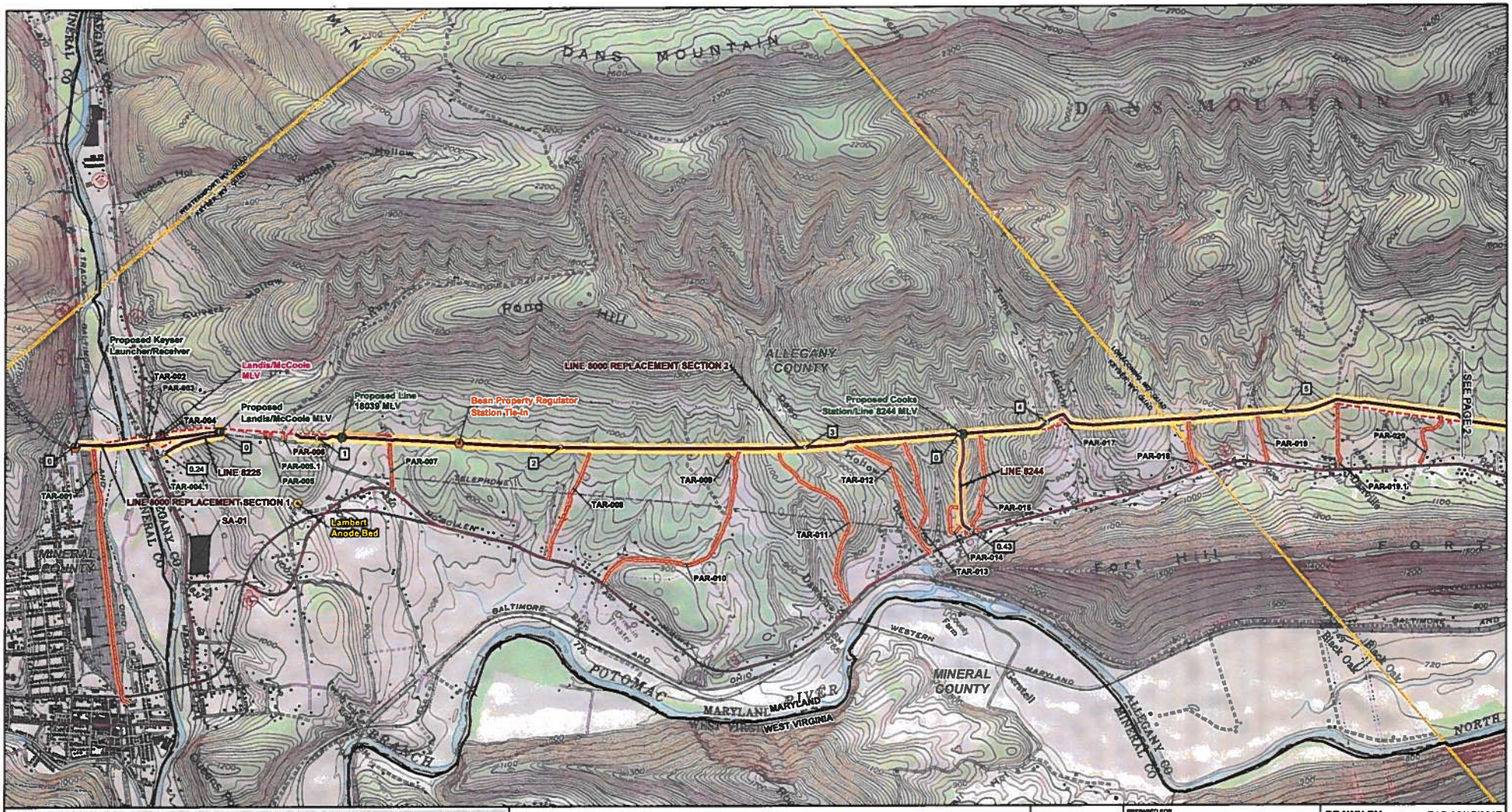
Spill Prevention briefings with the construction crew will be scheduled and conducted by the Contractor to ensure adequate understanding of spill prevention measures, as well as the content of this SPCC.

IX. Management Approval

This SPCC Plan is supported by management of Columbia Gas Transmission, LLC, having the authority to commit the necessary resources, including labor, equipment, and materials, to expeditiously control and remove and harmful quantity of hazardous materials spilled to waters, wetlands, sensitive area, and land.

November 14, 2012
Date

Environmental Compliance Coordinator
Columbia Gas Transmission, LLC



- MILE POST
- PROPOSED ANODE BEDS
- PROPOSED ABOVEGROUND FACILITY
- EXISTING ABOVEGROUND FACILITY TO BE MODIFIED
- ABANDONED ABOVEGROUND FACILITY
- PROPOSED LINE 8000 PROJECT CENTERLINE
- PROPOSED ACCESS ROAD
- EXISTING PIPELINE CENTERLINE
- PROPOSED STAGING AREA
- COUNTY BOUNDARY
- STATE BOUNDARY
- USGS QUADRANGLE BOUNDARY

MAPS COMPILED UTILIZING ESRI TOPOGRAPHIC BASEMAP.

LINE 8000 REPLACEMENT PROJECT

OVERVIEW MAP

MINERAL COUNTY, WEST VIRGINIA AND ALLEGANY COUNTY, MARYLAND

2,000 1,000 0 2,000 4,000 FEET

ABSOLUTE SCALE: 1:24,000

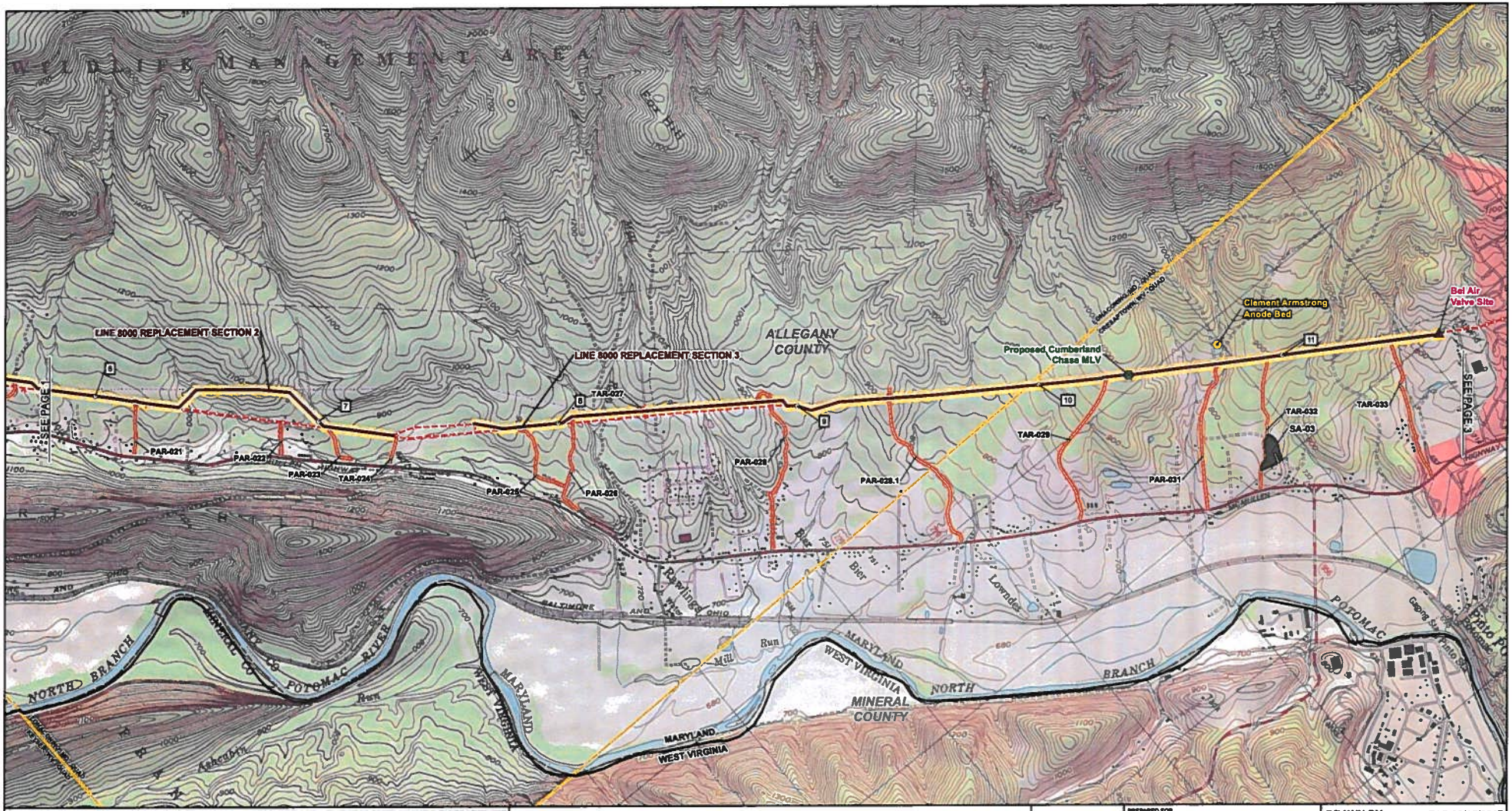
REFERENCE SCALE: 1 IN = 2,000 FT

PREPARED FOR: Columbia Gas Transmission

PREPARED BY: MOTT MACDONALD

ISSUED FOR BID 12/2018
CPG PROPRIETARY

DRAWN BY:	EAP 09/15/2017
CHECKED BY:	DD 12/12/2018
APPROVED BY:	CJC 12/12/2018
REV. DATE:	12/2018
REVISION:	B
DESC:	ISSUED FOR BID
PAGE:	D7261-GIS-001



1	MILE POST
	PROPOSED ANODE BEDS
	PROPOSED ABOVEGROUND FACILITY
	EXISTING ABOVEGROUND FACILITY TO BE MODIFIED
	ABANDONED ABOVEGROUND FACILITY
	PROPOSED LINE 8000 PROJECT CENTERLINE
	PROPOSED ACCESS ROAD
	EXISTING PIPELINE CENTERLINE
	PROPOSED STAGING AREA
	COUNTY BOUNDARY
	STATE BOUNDARY
	USGS QUADRANGLE BOUNDARY

MAPS COMPILED UTILIZING ESRI TOPOGRAPHIC BASEMAP.

LINE 8000 REPLACEMENT PROJECT

OVERVIEW MAP

ALLEGANY COUNTY, MARYLAND

2,000 1,000 0 2,000 4,000 FEET

ABSOLUTE SCALE: 1:24,000

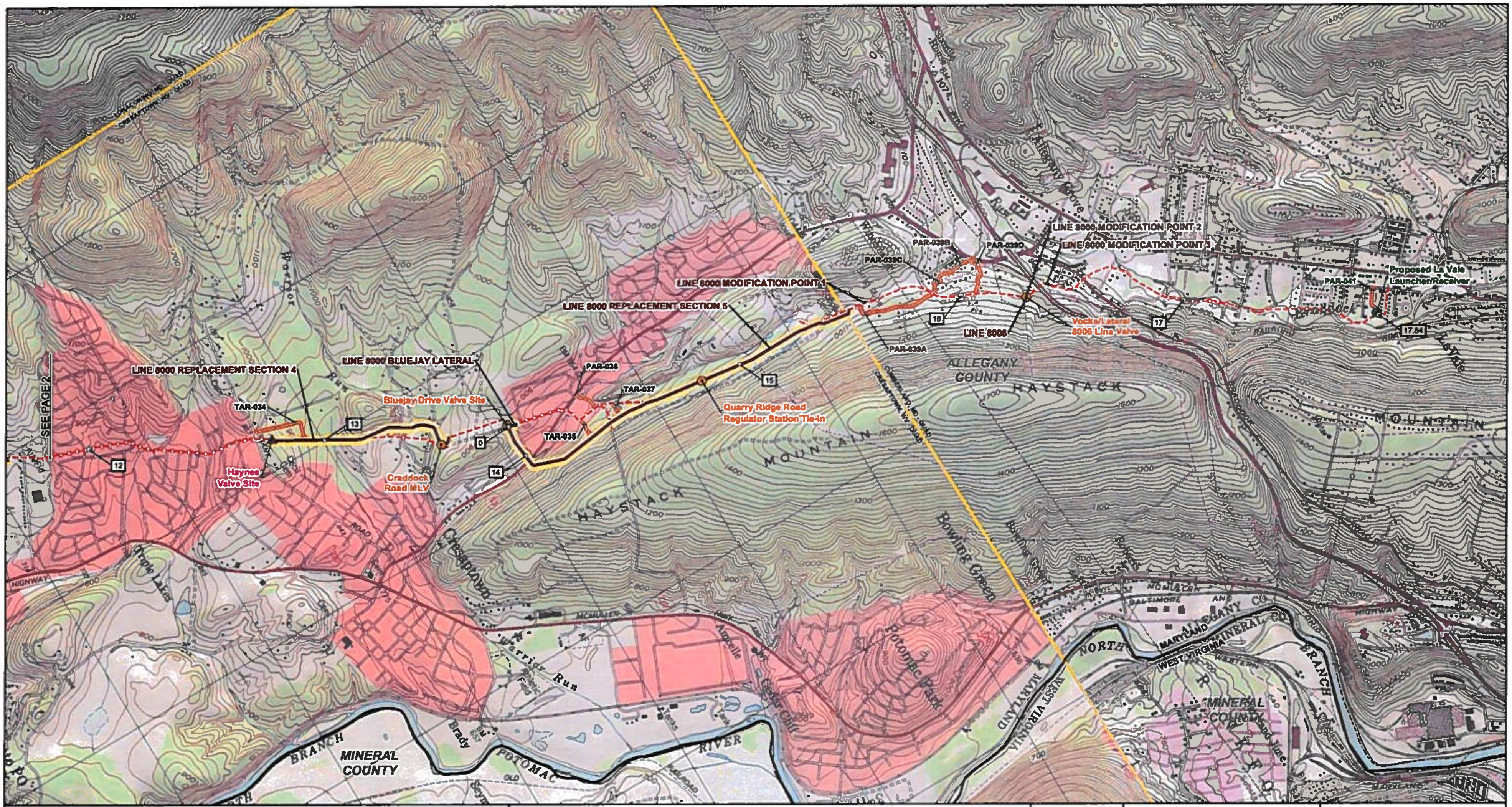
REFERENCE SCALE: 1 IN = 2,000 FT

PREPARED FOR: Columbia Gas Transmission

PREPARED BY: MOTT MACDONALD

ISSUED FOR BID 12/2018
CPG PROPRIETARY

DRAWN BY:	EAP 09/15/2017
CHECKED BY:	DD 12/12/2018
APPROVED BY:	CJC 12/12/2018
REV. DATE:	12/2018
REVISION:	B
DESC:	ISSUED FOR BID
PAGE:	D7261-GIS-002



1	MILE POST
	PROPOSED ANODE BEDS
	PROPOSED ABOVEGROUND FACILITY
	EXISTING ABOVEGROUND FACILITY TO BE MODIFIED
	ABANDONED ABOVEGROUND FACILITY
	PROPOSED LINE 8000 PROJECT CENTERLINE
	PROPOSED ACCESS ROAD
	EXISTING PIPELINE CENTERLINE
	PROPOSED STAGING AREA
	COUNTY BOUNDARY
	STATE BOUNDARY
	USGS QUADRANGLE BOUNDARY

MAPS COMPILED UTILIZING ESRI TOPOGRAPHIC BASEMAP.

LINE 8000 REPLACEMENT PROJECT

OVERVIEW MAP

ALLEGANY COUNTY, MARYLAND

2,000 1,000 0 2,000 4,000 FEET

ABSOLUTE SCALE: 1:24,000

REFERENCE SCALE: 1 IN = 2,000 FT

PREPARED FOR Columbia Gas Transmission

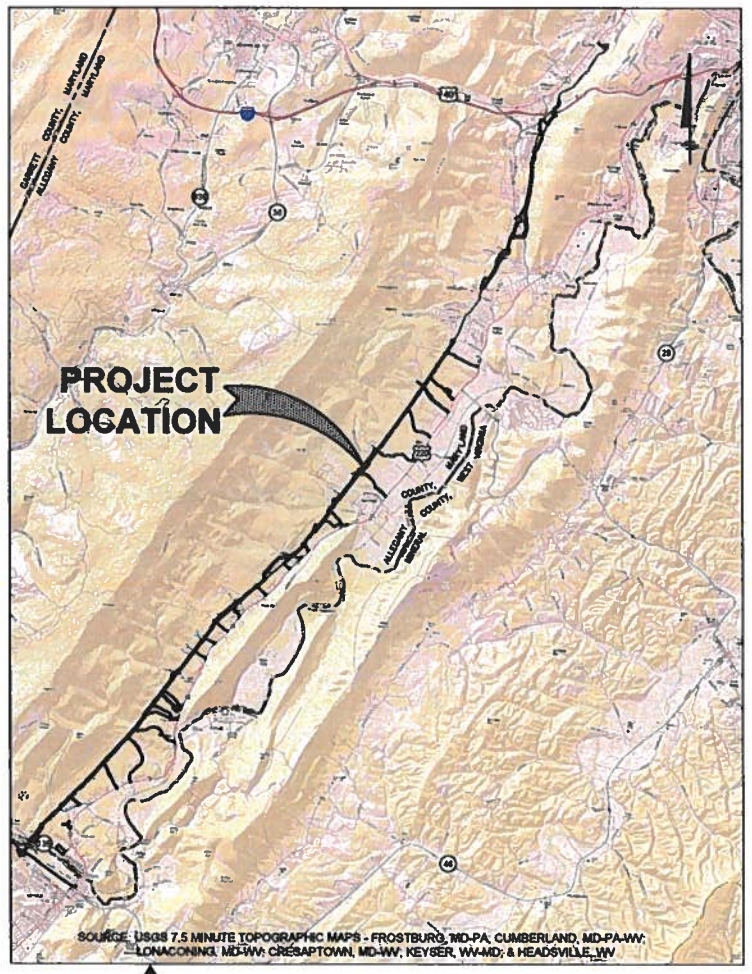
PREPARED BY MOTT MACDONALD

ISSUED FOR BID 12/2018
CPG PROPRIETARY

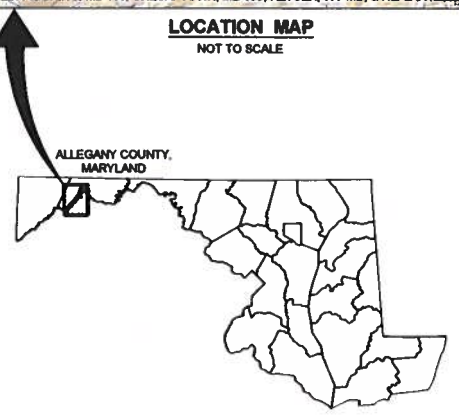
DRAWN BY:	EAP 09/15/2017
CHECKED BY:	DD 12/12/2018
APPROVED BY:	CJC 12/12/2018
REV. DATE:	12/2018
REVISION:	B
DESC:	ISSUED FOR BID
PAGE:	D7261-GIS-003

G:\Columbia\36318_Line_8000\GIS\MXD_FERC_FIGURES\CPG_LINE_8000_FERC_QUAD_OVERVIEW_11x17.mxd

LINE 8000
AQUATIC RESOURCE CROSSING DRAWINGS



LOCATION MAP
NOT TO SCALE



ALLEGANY COUNTY, MARYLAND
MINERAL COUNTY, WEST VIRGINIA

NOVEMBER 2018

COLUMBIA GAS TRANSMISSION, LLC.,
A TRANSCANADA COMPANY
HOUSTON, TEXAS

KEY CONTACTS:

OWNER:
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY
700 LOUISIANA STREET, SUITE 700
HOUSTON, TX 77002
TELEPHONE: 832.320.5780
CONTACT: ERNEST LADKANI

ENGINEERING FIRM:
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA, SUITE 600
BUFFALO, NY 14202
TELEPHONE: 315.671.9545
CONTACT: MICHAEL HIGGINS, P.E.

MARYLAND ONE-CALL
TELEPHONE: 811 OR 1.800.257.7777

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

DRAWING INDEX

XREFS: CGTL8000-TB-34x22
IMAGES:

PURPOSE:

THE PURPOSE OF THIS EROSION AND SEDIMENT CONTROL PLAN (ESCP) IS TO ENSURE COMPLIANCE WITH APPLICABLE RULES AND REGULATIONS AND TO PROTECT, MAINTAIN, AND ENHANCE THE PUBLIC HEALTH, SAFETY, AND GENERAL WELFARE BY ESTABLISHING MINIMUM REQUIREMENTS AND PROCEDURES TO CONTROL ADVERSE IMPACTS ASSOCIATED WITH LAND DISTURBANCES.

CONSTRUCTION SEQUENCE:

THE LINE 8000 PROJECT CONSTRUCTION ACTIVITIES ARE ANTICIPATED TO BEGIN IN 2019. THE FOLLOWING DESCRIBES THE TYPICAL SEQUENCE OF CONSTRUCTION ACTIVITIES.

SOIL DISTURBANCE (E.G., GRUBBING, AND TOPSOIL STRIPPING) SHALL BE MINIMIZED PRIOR TO INSTALLING EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH THIS PLAN. SIGNIFICANT DEVIATION FROM THE FOLLOWING SEQUENCE MUST BE APPROVED IN WRITING (E.G., VIA E-MAIL) BY THE AGENCY.

CONSTRUCTION PREPARATION ACTIVITIES:

1. THE CONTRACTOR SHOULD NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AT (301) 689-1480 AT LEAST SEVEN (7) DAYS BEFORE COMMENCING ANY LAND DISTURBING ACTIVITY UNLESS WAIVED BY MDE. CONTRACTOR SHALL BE REQUIRED TO HOLD A PRECONSTRUCTION MEETING BETWEEN PROJECT REPRESENTATIVES, THE CERTIFYING ENGINEER, THE ALLEGANY COUNTY LAND USE & PERMITTING ENGINEER AT (301) 876-9509 AND A REPRESENTATIVE OF THE MARYLAND DEPARTMENT OF THE ENVIRONMENT.
2. SURVEY AND STAKEOUT OR OTHERWISE DELINEATE THE APPROVED LIMITS OF DISTURBANCE (I.E., EXISTING PIPELINE CENTERLINE, CONSTRUCTION RIGHT-OF-WAY [ROW] BOUNDARIES, AND TEMPORARY WORKSPACE AREAS) AND FLAG THE LOCATIONS OF APPROVED ACCESS ROADS AND FOREIGN UTILITIES, AS APPLICABLE.
3. MARK OR FENCE FOR PROTECTION WETLAND BOUNDARIES AND OTHER ENVIRONMENTALLY SENSITIVE AREAS.
4. MOBILIZE CREW, FACILITIES, EQUIPMENT, AND MATERIALS REQUIRED TO COMPLETE THE WORK.
5. INSTALL STABILIZED CONSTRUCTION ENTRANCES WHERE LOCATED ON THE ESCP DRAWINGS.
6. INSTALL SILT FENCING, COMPOST FILTER SOCK, AND INTERCEPTOR DIVERSIONS AT THE LOCATIONS SHOWN ON THE ESCP DRAWINGS AND DOWNGRADIENT OF EARTH DISTURBANCE ACTIVITIES WHERE NECESSARY/APPROPRIATE.
7. NOTIFY THE MDE FOLLOWING INSTALLATION OF EROSION AND SEDIMENT CONTROLS.
8. BRIDGES MAY BE INSTALLED DURING THE INSTREAM TIME OF YEAR RESTRICTION TO FACILITATE TREE CLEARING OPERATIONS ONLY. NO INSTREAM WORK IS PERMITTED DURING THE INSTREAM TIME OF YEAR RESTRICTION FOR EACH STREAM. BRIDGES INSTALLED FOR TREE CLEARING OPERATIONS MUST BE REMOVED FOLLOWING COMPLETION OF TREE CLEARING AND THEN RE-INSTALLED AT THE TIME OF PIPELINE CONSTRUCTION.
9. CLEAR AND GRUB THE CONSTRUCTION ROW OF TREES, BRUSH, LOGS, AND ROCKS, AS NECESSARY. HAUL MERCHANTABLE TIMBER OFF-SITE OR STACK AT A LANDOWNER DESIGNATED LOCATION ON-SITE, BUT NOT WITHIN 50 FEET OF STREAMS, WETLANDS, OR FLOODPLAINS. UNMERCHANTABLE MATERIALS MAY BE CHIPPED AND BLOWN OFF THE CONSTRUCTION ROW (PER LANDOWNER AGREEMENT AND APPROVALS), EXCEPT IN AGRICULTURAL AREAS AND WITHIN 50 FEET OF STREAMS, WETLANDS, OR FLOODPLAINS.
10. PERFORM GRADING AS NECESSARY TO PROVIDE A LEVEL WORK SURFACE AND LEAVE ROOTSTOCK IN PLACE IN AREAS WHERE THE GROUND IS RELATIVELY FLAT AND DOES NOT REQUIRE GRADING.
11. SEGREGATE THE TOPSOIL, WHERE REQUIRED, FROM THE SUBSOIL WHERE POSSIBLE DURING LEVELING AND GRADING OF THE ROW AND/OR PRIOR TO TRENCH EXCAVATION TO FACILITATE SITE RESTORATION.

PIPELINE INSTALLATION – UPLAND LOCATIONS:

1. VERIFY EROSION AND SEDIMENT CONTROLS HAVE BEEN INSTALLED IN ACCORDANCE WITH THESE DRAWINGS AND TO THE SATISFACTION OF THE ENVIRONMENTAL INSPECTOR.
2. EXCAVATE THE PIPELINE TRENCH TO A DEPTH THAT WILL ALLOW FOR THE REQUIRED MINIMUM COVER TO BE PLACED OVER THE PIPELINE AFTER BACKFILLING.
3. STRING THE PIPE SECTION ALONG THE OPEN TRENCH IN A CONTINUOUS LINE.
4. BEND PIPE SECTIONS WHERE NECESSARY TO SHAPE THE PIPE TO THE CONTOURS OF THE TERRAIN, WELD THE PIPE JOINTS TOGETHER INTO LONG STRINGS AND PLACE THE STRINGS ON TEMPORARY SUPPORTS, AND LOWER THE WELDED PIPELINE INTO THE TRENCH.
5. INSTALL TRENCH PLUGS AT THE REQUIRED SPACING AS THE PIPELINE IS INSTALLED AS INDICATED ON THE ESCP DRAWINGS.
6. BACKFILL THE TRENCH USING EXISTING SUBSOIL MATERIAL AND ROUGH GRADE THE CONSTRUCTION ROW TO PRE-CONSTRUCTION CONTOURS MINUS THE DEPTH OF THE TOPSOIL.
7. REPLACE THE SEGREGATED TOPSOIL OVER THE CONSTRUCTION ROW.
8. APPLY PERMANENT SEED, FERTILIZER, AND MULCH OR SOIL STABILIZATION MATTING (WHERE REQUIRED).
9. REMOVE STABILIZED CONSTRUCTION ENTRANCES AND VEGETATE ENTRANCE AREAS.
10. INSTALL ASPHALT PAVING OR GRAVEL WHERE PREVIOUSLY REMOVED.
11. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
12. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

PIPELINE INSTALLATION – WETLAND CROSSINGS:

1. INSTALL TEMPORARY TIMBER MATS FOR CONSTRUCTION EQUIPMENT CROSSING OF THE WETLAND AS INDICATED ON THE ESCP DRAWINGS.
2. INSTALL SILT FENCING, COMPOST FILTER SOCK, AND WEIGHTED SEDIMENT FILTER TUBES AT THE ENDS OF THE TIMBER MATS AS INDICATED ON THE ESCP DRAWINGS.
3. SEGREGATE THE TOP 1 FOOT OF TOPSOIL AND VEGETATIVE ROOT MASS FROM THE AREA TO BE DISTURBED BY TRENCHING, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED OR FROZEN.
4. EXCAVATE THE PIPELINE TRENCH TO A DEPTH THAT WILL ALLOW FOR THE REQUIRED MINIMUM COVER TO BE PLACED OVER THE PIPELINE AFTER BACKFILLING. STOCKPILE THE SUBSOIL SEPARATELY FROM THE TOPSOIL OUTSIDE THE LIMIT OF THE WETLAND.
5. INSTALL THE PIPELINE WITHIN THE TRENCH AND INSTALL TRENCH PLUGS AT EITHER SIDE OF THE WETLAND EDGES AS INDICATED ON THE ESCP DRAWINGS.
6. REMOVE DEWATERING STRUCTURES FROM THE PIPE TRENCH.
7. BACKFILL THE TRENCH USING THE SEGREGATED SUBSOIL MATERIAL AND REPLACE THE SEGREGATED TOPSOIL AND VEGETATIVE ROOT MASS.
8. APPLY SEED WHERE NEEDED, IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON THIS SHEET.
9. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
10. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

PIPELINE INSTALLATION – STREAM CROSSINGS:

1. SCHEDULE CROSSINGS DURING LOW FLOW PERIODS IF POSSIBLE.
2. MOBILIZE ALL EQUIPMENT AND MATERIALS REQUIRED TO COMPLETE THE CROSSING.
3. INSTALL THE TEMPORARY BRIDGE STREAM CROSSING FOR CONSTRUCTION EQUIPMENT TRAVEL OVER THE STREAMS AS INDICATED ON THE ESCP DRAWINGS.
4. INSTALL SILT FENCING OR COMPOST FILTER SOCK AND WEIGHTED SEDIMENT FILTER TUBES AT THE ENDS OF THE TEMPORARY BRIDGE CROSSINGS AS INDICATED ON THE ESCP DRAWINGS.
5. BASED ON SITE CONDITIONS, CONTRACTOR SHALL DETERMINE WHETHER TO UTILIZE A FLUME CROSSING OR DAM AND PUMP BYPASS TO DIVERT STREAM FLOW AROUND THE WORK AREA.
6. WHERE USING A FLUME CROSSING, INSTALL A FLUME PIPE SIZED TO DIVERT THE ENTIRE STREAM. FLUME PIPE SHOULD BE SET WITH 10 PERCENT OF THE DIAMETER BELOW STREAMBED LEVELS WHERE SOIL CONDITIONS PERMIT; OTHERWISE, INSTALL AT STREAM GRADE AND SLOPE. ALIGN FLUME PIPE TO PREVENT BANK EROSION AND STREAMBED SCOUR.
7. CONSTRUCT THE UPSTREAM AND DOWNSTREAM SANDBAG DIVERSION DAMS (OR AQUA BARRIERS) WITHIN THE STREAM ON EITHER SIDE OF THE PROPOSED PIPELINE TRENCH ALIGNMENT AS INDICATED ON THE ESCP DRAWINGS.
8. WHERE UTILIZING A DAM AND PUMP BYPASS, BYPASS STREAM FLOW AROUND THE PROPOSED PIPELINE TRENCH BY INSTALLING THE BYPASS PUMP INTAKE AND DISCHARGE HOSES (AND DISCHARGE HOSE ENERGY DISSIPATERS), AND PUMPS AS INDICATED ON THE ESCP DRAWINGS. SIZE PUMPS FOR DIVERSION OF ENTIRE STREAM AROUND THE PIPELINE TRENCH. INSTALL PUMPS ON POLYETHYLENE BARRIERS FOR FUEL/OIL SPILL CONTAINMENT. SCREEN THE BYPASS PUMP INTAKE AND INSTALL THE INTAKE A SUFFICIENT DISTANCE FROM THE STREAM BOTTOM TO PREVENT PUMPING OF CHANNEL BOTTOM MATERIALS. MONITOR PUMPS AND WATER STRUCTURES ON A 24-HOUR BASIS UNTIL THE CROSSING INSTALLATION IS COMPLETE.
9. DEWATER THE PROPOSED TRENCH ALIGNMENT THROUGH THE STREAM BY PUMPING THE WATER TO A PUMP FILTER BAG.
10. EXCAVATE THE PIPELINE TRENCH TO A DEPTH THAT WILL ALLOW FOR THE REQUIRED MINIMUM COVER TO BE PLACED OVER THE PIPELINE AFTER BACKFILLING.
11. PLACE TRENCH SPOILS A MINIMUM OF 10 FEET FROM THE TOP OF THE STREAM BANKS WITHIN THE CONSTRUCTION ROW AND INSTALL A SEDIMENT BARRIER (I.E., SILT FENCE) DOWNGRADIENT OF ANY SPOIL PILES.
12. INSTALL THE PIPELINE WITHIN THE TRENCH AND INSTALL TRENCH PLUGS AT EITHER SIDE OF THE STREAM CHANNEL AS INDICATED ON THE ESCP DRAWINGS.
13. BACKFILL THE TRENCH WITH SPOIL MATERIAL AND RETURN ALL STREAMBANKS TO PRE-CONSTRUCTION CONTOURS.
14. REMOVE THE UPSTREAM AND DOWNSTREAM SANDBAG DIVERSION DAMS, AS APPLICABLE. REMOVE FLUME PIPE OR BYPASS PUMP INTAKES, PUMP, AND ENERGY DISSIPATER.
15. APPLY PERMANENT SEEDING TO DISTURBED RIPARIAN AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON THIS SHEET.
16. COLUMBIA WILL INCORPORATE THE FOLLOWING CROSSINGS IN THE PLANTING SCHEDULE USED AT STATE OWNED LANDS: TM1-S19; TM2-S14; TM2-S18; TM1-S32; TM1-S24 & TM1-S24B; AND TM1-S23. COLUMBIA WILL SEGREGATE AND REUSE THE EXISTING STREAMBANK SOILS AND STREAM BOTTOM MATERIAL FOR USE IN RESTORATION. THIRTY DAYS AFTER COMPLETION OF THE WORK, COLUMBIA WILL INSPECT THE STABILIZATION MEASURES AND CORRECT AS NEEDED. COLUMBIA WILL CONTINUE TO MONITOR THESE CROSSINGS ONCE PER YEAR UNTIL AT LEAST 70% VEGETATIVE COVER IS ACHIEVED.
17. REMOVE TEMPORARY BRIDGE STREAM CROSSING AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF WORK ACTIVITIES REQUIRING THE CROSSING.
18. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
19. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

PIPELINE INSTALLATION – HORIZONTAL DIRECTIONAL DRILL LOCATIONS:

1. ALL HORIZONTAL DIRECTIONAL DRILL (HDD) ACTIVITIES MUST BE CONDUCTED IN ACCORDANCE WITH THE HDD CONTINGENCY PLAN.
2. IN ACCORDANCE WITH THE HDD CONTINGENCY PLAN, AN INDEPENDENT ENVIRONMENTAL MONITOR IS REQUIRED TO ENSURE COMPLIANCE WITH THE SCOPE AND CONDITIONS OF THE PERMIT. THE INDEPENDENT ENVIRONMENTAL MONITOR MUST BE ON SITE DURING HDD CONSTRUCTION ACTIVITIES AND REPORT DIRECTLY TO THE MARYLAND DEPARTMENT OF THE ENVIRONMENT'S COMPLIANCE PROGRAM.
3. THE PERMITTEE MUST COORDINATE CONSTRUCTION ACCESS AND/OR ANY POTENTIAL DISRUPTION OF ACTIVITIES AT THE MCCOOLE FMA WITH ALAN KLOTZ, OF DNR FISHERIES AT (240) 215-5676.
4. HDD ACTIVITY UNDER THE NORTH BRANCH OF THE POTOMAC RIVER IS SUBJECT TO THE USE 1 TIME OF YEAR INSTREAM WORK PROHIBITION FROM MARCH 1ST THROUGH JUNE 15TH OF ANY YEAR.
5. VERIFY EROSION AND SEDIMENT CONTROLS HAVE BEEN INSTALLED IN ACCORDANCE WITH THESE DRAWINGS AND TO THE SATISFACTION OF THE ENVIRONMENTAL INSPECTOR.
6. PERFORM EXCAVATION WHERE NECESSARY TO DRILL THE PILOT HOLE ALONG THE PRE-DETERMINED ALIGNMENT WITH A CONTINUOUS STRING STEEL DRILL ROD.
7. ATTACH A BACK REAMER TO THE STEEL DRILL ROD WHEN THE BORE HEAD AND ROD EMERGE ON THE OPPOSITE SIDE OF THE CROSSING.
8. PULL BACK THE REAMER THROUGH THE PILOT HOLE TO ENLARGE THE DRILL HOLE TO THE DESIRED FINISH DIAMETER NEEDED TO PULL BACK THE PIPELINE THROUGH THE HOLE.
9. INJECT DRILLING MUD (E.G. FLUID BENTONITE CLAY) INTO THE BORE DURING CUTTING AND REAMING TO STABILIZE THE HOLE AND REMOVE SOIL CUTTINGS.
10. PULL THE ENTIRE PIPELINE LENGTH IN ONE SEGMENT BACK THROUGH THE DRILLING MUD ALONG THE REAMED-HOLE PATHWAY.
11. BACKFILL THE EXCAVATION USING EXISTING SUBSOIL MATERIAL AND ROUGH GRADE THE CONSTRUCTION ROW TO PRE-CONSTRUCTION CONTOURS MINUS THE DEPTH OF THE TOPSOIL.
12. REPLACE THE SEGREGATED TOPSOIL OVER THE CONSTRUCTION ROW.
13. APPLY PERMANENT SEED, FERTILIZER, AND MULCH OR SOIL STABILIZATION MATTING (WHERE REQUIRED).
14. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
15. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

SEQUENCE OF CONSTRUCTION FOR CULVERTS AND UTILITY CROSSINGS:

1. NOTIFY THE MDE COMPLIANCE DIVISION 5 DAYS PRIOR TO THE START OF CONSTRUCTION.
2. PERFORM IN-STREAM CONSTRUCTION DURING A PERIOD OF EXPECTED CLEAR WEATHER.
3. IMPLEMENT EROSION AND SEDIMENT CONTROL MEASURES (E.G., SILT FENCE).
4. IMPLEMENT DIVERSION AND DEWATERING MEASURES (I.E., DAM AND PUMP BYPASS, FILTER BAG).
5. REMOVE EXISTING CULVERT AND INSTALL NEW CULVERT AND ROCK OUTLET PROTECTION AS SHOWN ON THE ESCP DRAWINGS.
6. REMOVE DIVERSION AND DEWATERING MEASURES.
7. APPLY SEED AND MULCH TO DISTURBED AREAS IN ACCORDANCE WITH THE SEEDING RESTORATION TABLES ON THIS SHEET.
8. REMOVE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES ONCE THE SITE HAS BEEN STABILIZED BY A MINIMUM, UNIFORM, PERENNIAL 95% VEGETATIVE COVER.
9. IMMEDIATELY STABILIZE AREAS (IF ANY) DISTURBED DURING REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

EXISTING PIPELINE ABANDONMENT/REMOVAL/GROUTING – UPLAND AND ROADWAY:

1. EXCAVATE TO THE LIMITS NECESSARY TO ACCESS AND REMOVE THE PIPELINE SEGMENT. ATTEMPT TO PRESERVE EXISTING TOPSOIL SEPARATE FROM SUBSOIL FOR REUSE DURING FINAL RESTORATION IN SENSITIVE AREAS (E.G., LAWNS, AGRICULTURAL FIELDS).
2. CUT AND CAP THE ENDS OF THE EXPOSED PIPE TO REMAIN.
3. FOR PIPELINE SEGMENTS TO BE GROUTED (SEE THE ESCP DRAWINGS FOR LOCATIONS), ABANDON THE EXISTING PIPELINE IN-PLACE BY CUTTING, FILLING WITH GROUT, AND CAPPING THE PIPE ENDS.
4. FOR PIPELINE SEGMENTS TO BE REMOVEDTOPSOIL STOCKPILES WILL BE PLACED WITHIN THE RIGHT-OF-WAY IN A WINDROW ADJACENT TO THE PIPELINE TRENCH.
5. BACKFILL THE EXCAVATION USING EXCAVATED SUBSOIL MATERIAL AND ROUGH GRADE THE AREA TO PRE-CONSTRUCTION GRADE MINUS THE DEPTH OF TOPSOIL.
6. REPLACE THE SEGREGATED TOPSOIL OVER THE EXCAVATION, PERFORM FINAL GRADING, AND COMPLETE FINAL CLEANUP.

EXISTING PIPELINE ABANDONMENT/REMOVAL/GROUTING – STREAM:

1. SCHEDULE CROSSINGS DURING LOW FLOW PERIODS IF PRACTICABLE.
2. MOBILIZE ALL EQUIPMENT AND MATERIALS REQUIRED TO COMPLETE THE REMOVAL.
3. FOR PIPELINE SEGMENTS THAT WILL BE REMOVED, INSTALL A FLUME CROSSING OR DAM AND PUMP BYPASS SYSTEM IN THE STREAM.
4. INSTALL TEMPORARY BRIDGE STREAM CROSSING (IF APPLICABLE).
5. EXCAVATE TO THE LIMITS NECESSARY TO ACCESS AND REMOVE THE PIPELINE SEGMENT. ATTEMPT TO PRESERVE EXISTING TOPSOIL SEPARATE FROM SUBSOIL FOR REUSE DURING FINAL RESTORATION IN SENSITIVE AREAS (E.G., LAWNS, AGRICULTURAL FIELDS).
6. PLACE SPOILS (AS REQUIRED) A MINIMUM OF 10 FEET FROM THE TOP OF THE STREAM BANKS WITHIN THE ROW AND INSTALL A SEDIMENT BARRIER DOWNGRADIENT OF ANY SPOIL PILES. SEGREGATE SUBSOIL FROM TOPSOIL OR STREAM SUBSTRATE.
7. CUT AND CAP THE ENDS OF THE EXPOSED PIPE TO REMAIN.
8. FOR PIPELINE SEGMENTS TO BE GROUTED (SEE THE ESCP DRAWINGS FOR LOCATIONS), ABANDON THE EXISTING PIPELINE IN-PLACE BY CUTTING, FILLING WITH GROUT, AND CAPPING THE PIPE ENDS.
9. BACKFILL THE EXCAVATION WITH SUBSOIL AND THEN TOPSOIL OR STREAM SUBSTRATE, AS APPLICABLE.
10. APPLY PERMANENT SEEDING TO DISTURBED RIPARIAN AREAS IN ACCORDANCE WITH THE SEEDING AND RESTORATION TABLE.
11. REMOVE TEMPORARY STREAM CROSSINGS (IF APPLICABLE) AS SOON AS PRACTICABLE FOLLOWING COMPLETION OF WORK ACTIVITIES REQUIRING THE CROSSING.

EXISTING PIPELINE ABANDONMENT/REMOVAL/GROUTING – WETLAND:

1. EXCAVATE TO THE LIMITS NECESSARY TO ACCESS AND REMOVE THE PIPELINE SEGMENT. SEGREGATE THE TOP 1 FOOT OF TOPSOIL AND VEGETATIVE ROOT MASS FROM THE AREA TO BE DISTURBED BY EXCAVATION, EXCEPT IN AREAS WHERE STANDING WATER IS PRESENT OR SOILS ARE SATURATED OR FROZEN.
2. INSTALL TEMPORARY TIMBER MATS FOR CONSTRUCTION EQUIPMENT CROSSING OF THE WETLAND AS INDICATED ON THE ESCP DRAWINGS (IF APPLICABLE).
3. INSTALL SILT FENCING OR COMPOST FILTER SOCK AND WEIGHTED SEDIMENT FILTER TUBES AT THE ENDS OF THE TIMBER MATS AS INDICATED ON THE ESCP DRAWINGS.
4. CUT AND CAP THE ENDS OF THE EXPOSED PIPE TO REMAIN.
5. FOR PIPELINE SEGMENTS TO BE GROUTED (SEE THE ESCP DRAWINGS FOR LOCATIONS), ABANDON THE EXISTING PIPELINE IN-PLACE BY CUTTING, FILLING WITH GROUT, AND CAPPING THE PIPE ENDS.
6. BACKFILL THE EXCAVATION USING EXCAVATED SUBSOIL MATERIAL AND REPLACE THE SEGREGATED TOPSOIL AND VEGETATIVE ROOT MASS.
7. REMOVE TEMPORARY TIMBER MATS AND GEOTEXTILE UNDERLAYMENT AS SOON AS PRACTICABLE.
8. APPLY ANNUAL RYEGRASS AT A RATE OF 40 POUNDS PER ACRE, WHERE NEEDED, AND STRAW MULCH AT A RATE OF 2 TONS PER ACRE TO AREAS WITHOUT STANDING WATER, AND WITHOUT USING BINDING AGENTS.

DEMOBILIZATION AND SITE CLEANUP:

1. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION (I.E., UNIFORM, PERENNIAL, MINIMUM 95% VEGETATIVE COVER OF ALL DISTURBED AREAS), THE OWNER AND/OR OPERATOR SHALL OBTAIN APPROVAL FROM THE MDE.
2. REMOVAL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES UPON APPROVAL OF MDE.
3. PERMANENTLY STABILIZE ANY AREAS THAT ARE DISTURBED DURING REMOVAL OF THE TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.
4. DEMOBILIZE CREW, FACILITIES, EQUIPMENT, AND MATERIALS FROM THE SITE.

GENERAL EROSION AND SEDIMENT CONTROL NOTES:

1. PROJECT REPRESENTATIVES SHALL CONTACT THE MDE AT THE FOLLOWING STAGES OF THE PROJECT, UNLESS OTHERWISE DIRECTED BY MDE REPRESENTATIVES
   a. PRIOR TO THE START OF EARTH DISTURBANCE;
   b. UPON COMPLETION OF THE INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROL MEASURES, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING;
   c. PRIOR TO THE START OF ANOTHER PHASE OF CONSTRUCTION OR OPENING OF ANOTHER GRADING UNIT; AND
   d. PRIOR TO THE REMOVAL OF EROSION AND SEDIMENT CONTROL PRACTICES.
2. PRIOR TO CONSTRUCTION, CONSTRUCTION PERSONNEL RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL SHALL HAVE OBTAINED A CERTIFICATE OF TRAINING FROM AN MDE APPROVED TRAINING PROGRAM FOR EROSION AND SEDIMENT CONTROL.
3. CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THIS ESCP, INCLUDING THE INSPECTION AND MAINTENANCE OF ALL CONTROLS. REGULATORY AGENCIES SHALL BE PROVIDED RIGHT OF ENTRY TO THE SITE FOR PERIODIC ON-SITE EVALUATION OF THE CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH THE ESCP.
4. ADDITIONAL AND/OR MODIFICATIONS TO THE PROPOSED EROSION AND SEDIMENT CONTROLS MAY BE REQUIRED BASED ON ACTUAL FIELD CONDITIONS ENCOUNTERED AT THE TIME OF CONSTRUCTION. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY SUBSTANTIVE CHANGES TO THE APPROVED ESCP PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
5. ACCUMULATED SOIL MATERIALS REMOVED FROM EROSION AND SEDIMENT CONTROLS SHALL BE SPREAD WITHIN THE CONSTRUCTION ROW AND STABILIZED. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE APPLICABLE REGULATIONS.
6. GENERAL SITE CLEARING, GRUBBING, AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE EROSION AND SEDIMENT CONTROLS FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS ESCP.
7. TOPSOIL SHALL BE STOCKPILED SEPARATELY FROM SUBSOIL AT THE WORK AREA EXCAVATIONS FOR REUSE WITHIN ACTIVELY CULTIVATED OR ROTATED CROPLANDS AND PASTURES, RESIDENTIAL AREAS, HAYFIELDS, AND OTHER AREAS AT THE LANDOWNER'S OR LAND MANAGING AGENCY'S REQUEST.
8. ALL DISTURBED GRAVEL AND PAVED AREAS SHALL BE REPLACED IN-KIND IN COORDINATION WITH THE LANDOWNER.
9. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION MUST BE COMPLETED WITHIN:
   a. 3 CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3H:1V; AND
   b. 7 CALENDAR DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

BASEMAP NOTES:

1. TOPOGRAPHIC INFORMATION OBTAINED FROM WAS OBTAINED FROM MARYLAND IMAP.
2. FEATURE DATA WITHIN THE PROJECT AREA IS BASED UPON GPS SURVEY PROVIDED BY MOTT MACDONALD AND DIGITIZED INFORMATION OBTAINED FROM GOOGLE EARTH AERIAL IMAGERY.
3. EXISTING CONTOURS ARE SHOWN AT A 2-FOOT CONTOUR INTERVAL.
4. EFFECTIVE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOODPLAIN BOUNDARY INFORMATION WAS OBTAINED FROM MARYLAND IMAP.

PERMANENT STABILIZATION NOTES:

1. A SOIL TEST IS REQUIRED FOR ANY EARTH DISTURBANCE OF 5 ACRES OR MORE. THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT ARE:
   a. SOIL PH BETWEEN 6.0 AND 7.0.
   b. SOLUBLE SALTS LESS THAN 500 PARTS PER MILLION (PPM).
   c. SOIL CONTAINS LESS THAN 40% CLAY BUT ENOUGH FINE GRAINED MATERIAL (GREATER THAN 30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION: IF LOVEGRASS WILL BE PLANTED, THEN A SANDY SOIL (LESS THAN 30% SILT PLUS CLAY) WOULD BE ACCEPTABLE.
   d. SOIL CONTAINS 1.5 PERCENT MINIMUM ORGANIC MATTER BY WEIGHT.
   e. SOIL CONTAINS SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
2. APPLICATION OF AMENDMENTS OR TOPSOIL IS REQUIRED IF ON-SITE SOILS DO NOT MEET THE ABOVE CONDITIONS.
3. GRADED AREAS MUST BE MAINTAINED IN A TRUE AND EVEN GRADE AS SPECIFIED ON THE APPROVED ESCP, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 TO 5 INCHES.
4. APPLY SOIL AMENDMENTS AS SPECIFIED ON THE APPROVED PLAN OR AS INDICATED BY THE RESULTS OF A SOIL TEST.
5. MIX SOIL AMENDMENTS INTO THE TOP 3 TO 5 INCHES OF SOIL BY DISKING OR OTHER SUITABLE MEANS. RAKE LAWN AREAS TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION. TRACK SLOPES 3H:1V OR FLATTER WITH TRACKED EQUIPMENT LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. LEAVE THE TOP 1 TO 3 INCHES OF SOIL LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE UNNECESSARY ON NEWLY DISTURBED AREAS.

TEMPORARY SEEDING/WETLAND SEED MIX

HARDINESS ZONE: 6A				FERTILIZER RATE* (10-20-20) (LBS/ACRE)	LIME RATE* (TONS/ ACRE)	STRAW MULCH RATE (TONS/ ACRE)
SEED MIXTURE: COOL SEASON GRASS MIXES						
SPECIES	APPLICATION RATE (LBS/ACRE)	OPTIMAL SEEDING DATES	SEEDING DEPTHS (IN)			
ANNUAL RYEGRASS	40	MARCH 15 TO MAY 31; AUGUST 1 TO SEPTEMBER 30	1.0 (TEMPORARY) 0.5 (WETLANDS)	436	2	2.5

* DO NOT APPLY FERTILIZER OR LIME TO SEED MIXTURE WHEN USED FOR WETLAND RESTORATION APPLICATIONS.

UTILITY RIGHTS-OF-WAY

HARDINESS ZONE: 6A				FERTILIZER TYPE (10-20-20) (LBS/ACRE)			LIME RATE (TONS/ ACRE)	STRAW MULCH RATE (TONS/ ACRE)
SEED MIXTURE: COOL SEASON GRASS MIXES								
SPECIES	APPLICATION RATE (LBS/ACRE)	OPTIMAL SEEDING DATES	SEEDING DEPTHS (IN)	N	P_2O	K_2O		
TALL FESCUE	40	MARCH 1 TO JUNE 15; AUGUST 15 TO OCTOBER 15	¼-½	45	90	90	2	2.5
PERENNIAL RYEGRASS	25							
BIRDSFOOT TREFOIL	8							

RESIDENTIAL AREAS

HARDINESS ZONE: 6A				FERTILIZER TYPE (10-20-20) (LBS/ACRE)			LIME RATE (TONS/ ACRE)	STRAW MULCH RATE (TONS/ ACRE)
SEED MIXTURE: COOL SEASON GRASS MIXES								
SPECIES	APPLICATION RATE (LBS/ACRE)	OPTIMAL SEEDING DATES	SEEDING DEPTHS (IN)	N	P_2O	K_2O		
TALL FESCUE	100	MARCH 1 TO JUNE 15; AUGUST 15 TO OCTOBER 15	¼-½	45	90	90	2	2.5

PLANS APPROVED BY: [signature]
DATE: 2/4/19
MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND – MICHAEL B. HIGGINS – PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

GENERAL NOTES

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-01

MAINTENANCE SCHEDULE

E&S CONTROL MEASURE	INSPECTION REQUIREMENT	MAINTENANCE/REPAIR REQUIREMENT
STABILIZED CONSTRUCTION ENTRANCE	CONTINUOUSLY DURING WORK DAY AND THE NEXT DAY AFTER EACH RAIN EVENT	CONSTANTLY MAINTAIN IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT BY ADDING STONE OR MAKING OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN A CLEAN SURFACE, THE MOUNTABLE BERM, AND THE SPECIFIED DIMENSIONS. ALL STONE OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO THE ADJACENT ROADWAY MUST BE REMOVED IMMEDIATELY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING THE ROADWAY TO REMOVE SEDIMENT TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE. INSTALL WITH WASH RACKS AS NEEDED.
ADEQUATE VEGETATIVE STABILIZATION	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	ADEQUATE VEGETATIVE STABILIZATION REQUIRES 95% GROUNDCOVER. IF AN AREA HAS LESS THAN 40% GROUNDCOVER, RESTABILIZE FOLLOWING THE ORIGINAL RECOMMENDATIONS FOR LIME, FERTILIZER, SEEDBED PREPARATION, AND SEEDING. IF AN AREA HAS BETWEEN 40% AND 94% GROUNDCOVER, OVER-SEED AND FERTILIZE USING HALF OF THE RATES ORIGINALLY SPECIFIED.
SOIL STABILIZATION MATTING	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	ESTABLISH AND MAINTAIN VEGETATIVE STABILIZATION SO THAT ADEQUATE VEGETATIVE STABILIZATION (95% GROUNDCOVER) IS CONTINUOUSLY MET.
SILT FENCE	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN THE SILT FENCE OR WHEN SEDIMENT REACHES 25% OF THE FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. REINSTALL FENCE IF UNDERMINING OCCURS.
FILTER BAG	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REPLACE CLOGGED FILTER BAGS. REPLACE THE FILTER BAG IF THE BAG IS RIPPED, TORN, AND/OR PUNCTURED. KEEP THE CONNECTION BETWEEN THE PUMP HOSE AND FILTER BAG WATER TIGHT DURING OPERATION. REPLACE BEDDING THAT BECOMES DISPLACED.
INTERCEPTOR DIVERSIONS / BROAD BASED DIPS	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	MAINTAIN THE LINE, GRADE, AND CROSS-SECTION OF THE INTERCEPTOR DIVERSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS AND MAINTAIN POSITIVE DRAINAGE. KEEP INTERCEPTOR DIVERSION FREE OF EROSION WITH VEGETATIVE STABILIZATION.
TRENCH PLUGS	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REMOVE WATER THAT ACCUMULATES BEHIND TRENCH PLUGS WITH DEWATERING PUMPS DISCHARGING THROUGH PUMPED WATER FILTER BAGS.
TEMPORARY ACCESS BRIDGE	DAILY AND THE NEXT DAY AFTER EACH RAIN EVENT	STABILIZE THE APPROACH TO THE BRIDGE AND KEEP FREE OF EROSION. CLEAN DECKING AND CURBS OF SEDIMENT DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. MAINTAIN THE DECKING AND CURBS TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY THE BRIDGE. MAINTAIN AREAS ADJACENT TO THE CROSSING TO MEET THE REQUIREMENTS OF ADEQUATE VEGETATIVE STABILIZATION.
WEIGHTED SEDIMENT FILTER TUBE	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REPLACE DAMAGED TUBES WITHIN 24 HOURS OF INSPECTION. REMOVE SEDIMENT WHEN ACCUMULATION REACHES ½ ABOVE GROUND HEIGHT OF TUBE AND UPON REMOVAL FOR EQUIPMENT CROSSING.
WETLAND CROSSING	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REPAIR DAMAGES WITHIN 24 HOURS OF INSPECTION AND PRIOR TO ANY SUBSEQUENT USE. REMOVE SEDIMENT DEPOSITS ON CROSSING OR APPROACHES TO CROSSING WITHIN 24 HOURS OF INSPECTION.
DAM AND PUMP BYPASS STREAM CROSSING	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	IMMEDIATELY REPAIR OR REPLACE ANY FAILED PUMP OR LEAKS IN PIPING AND/OR IMPROPER CONNECTION TO THE PUMP. REPAIR ANY EROSION AT THE DISCHARGE POINT AND INSTALL MEASURES TO PREVENT FURTHER EROSION. IMMEDIATELY REPAIR LEAKS OR DAMAGES TO THE IMPERVIOUS DAM.
COMPOST FILTER SOCK	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REMOVE SEDIMENT AS NECESSARY TO MAINTAIN EFFECTIVENESS OF THE SOCK. AT A MINIMUM, REMOVE SEDIMENT WHEN ACCUMULATION REACHES ½ ABOVE GROUND HEIGHT OF SOCK. REPAIR DAMAGED SOCKS ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACE WITHIN 24 HOURS OF INSPECTION. REPLACE SOCKS ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
TEMPORARY GABION	WEEKLY AND THE NEXT DAY AFTER EACH RAIN EVENT	REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN TWELVE INCHES OF THE WEIR CREST. REPLACE THE GEOTEXTILE AND STONE FACING WHEN THE STRUCTURE CEASES TO FUNCTION. THE LINE, GRADE, AND CROSS SECTION MUST BE MAINTAINED.

PLANS APPROVED BY: _____
DATE: _____
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND:

- EXISTING BUILDING
- 980 EXISTING ELEVATION CONTOUR
- x x EXISTING FENCE LINE
- EXISTING ROAD
- EXISTING GRAVEL ROAD
- G EXISTING GAS TRANSMISSION LINES
- OE EXISTING OVERHEAD ELECTRIC LINE
- C EXISTING UNDERGROUND CABLE LINE
- EXISTING CULVERT
- EXISTING WATER WELL
- EXISTING POWER POLE
- EXISTING GUY WIRE ANCHOR
- EXISTING RAILROAD
- EXISTING TREELINE
- PROPOSED HDD ENTRY/EXIT LOCATION
- BRIDGE
- CONCRETE
- CURB
- DIRT
- GATE
- GRAVEL
- GUARD RAIL
- PAVEMENT
- RAILROAD
- RIPRAP
- ROAD CENTERLINE
- SIGN
- LANDSCAPING
- TREE
- PIPE MARKER POSTS
- CLIENT CENTER LINE
- FOREIGN PIPELINE CENTERLINES
- EC ELECTRIC_L/CABLE LINE
- ELECTRIC_S
- CP FIBER OPTIC
- UTILITY GAS LDC_L
- GM GAS MARKER
- SS UTILITY SEWER_L
- SS UTILITY SEWER_S
- T TELEPHONE_L
- W UTILITY WATER_L
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED
- APPROXIMATE STATE BOUNDARY

- STREAM FLOW DIRECTION
- 25-FOOT NON-TIDAL WETLAND BUFFER
- 100+00 G PROPOSED LINE 8000 GAS TRANSMISSION LINE
- LOD LIMIT OF DISTURBANCE
- ACCESS ROAD
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- SS WI AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING 2/D-03, 1/D-04
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) 1/D-01, 2/D-01
- SOIL STABILIZATION MATTING 1/D-03
- WEIGHTED SEDIMENT FILTER TUBE 2/D-04
- INTERCEPTOR DIVERSION 1/D-02
- TRENCH PLUG 2/D-02
- SF SILT FENCE 3/D-01
- SSF SUPER SILT FENCE 4/D-01
- 24 24 24 24" COMPOST FILTER SOCK 1/D-07
- 32 32 32 32" COMPOST FILTER SOCK
- TEMPORARY GABION 3/D-06
- SAND BAG DIVERSION 3/D-03
- P F PUMP AND FILTER BAG 3/D-02
- BROAD-BASED DIP 3/D-04
- X/X DETAIL REFERENCE NUMBER / DRAWING REFERENCE NUMBER
- DRAWING VIEW OUTLINE
- X-01 DRAWING NUMBER

XREFS:
CGTL8000-TB-34x22

IMAGES:

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND · MICHAEL B. HIGGINS · 52652 · PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

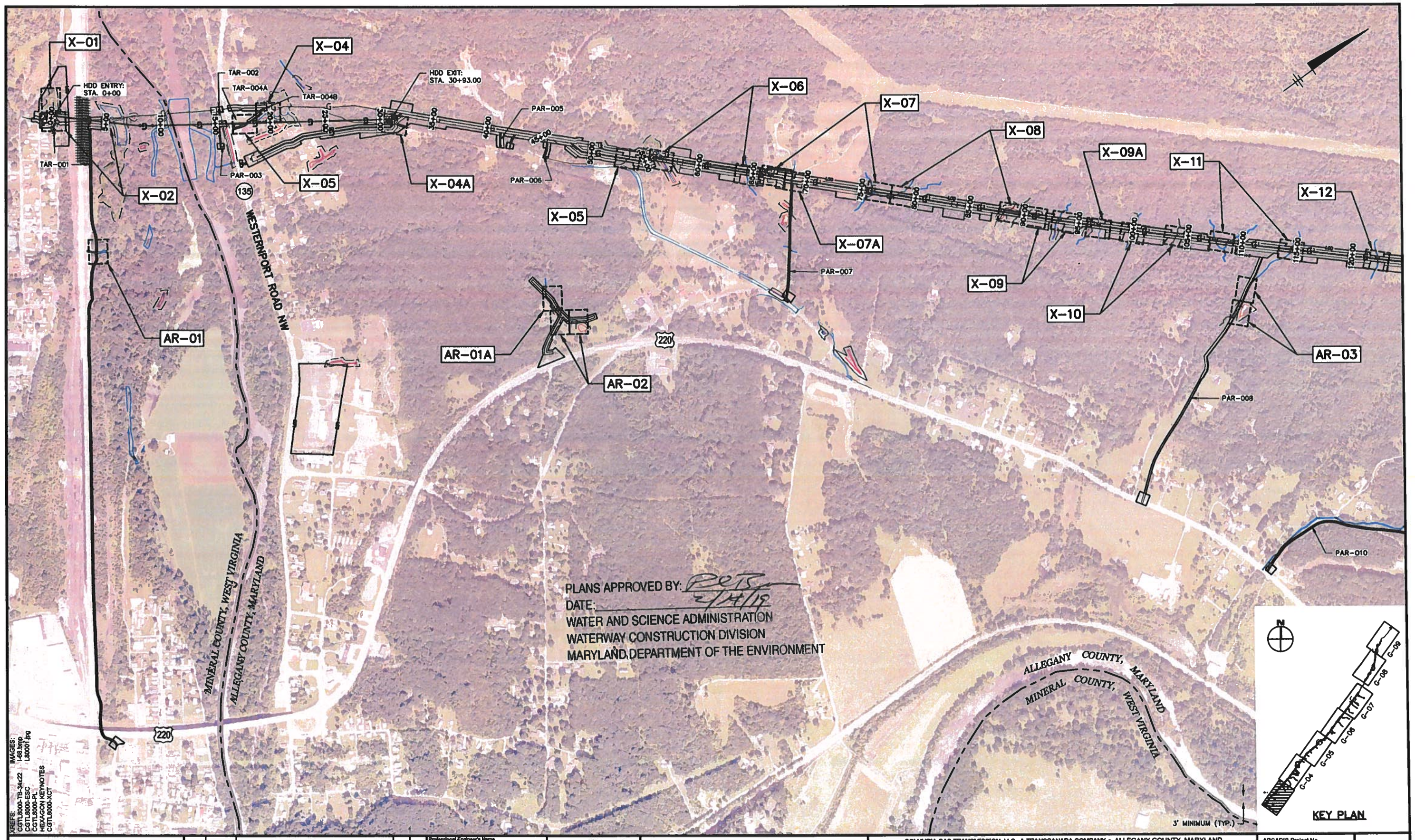
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

GENERAL NOTES & LEGEND

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-02



PLANS APPROVED BY: _____
DATE: _____
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

XREFS:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-PL
CGTL8000-KEYNOTES
CGTL8000-XCT
IMAGES:
I-68.bmp
L80001.jpg

User:TTITTLE SpecAUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSING\SIG-03--G-09.DWG Scale:1:1 SavedDate:11/20/2018 Time:10:16 Plot Date: Title, Taylor H, 11/26/2018, 16:01 : Layout:3

400' 0 400' 800'
1"=400'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

OVERALL KEY PLAN (1 OF 7)

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 800
BUFFALO, NY 14202
Tel. 315.671.9545

G-03

X-12 X-12A X-13 X-14 X-15 X-16 X-17

PAR-009 PAR-010 BORE ENTRY BORE EXIT X-14A PAR-017B PAR-017A

AR-04 AR-06 AR-05

TAR-012 TAR-013 TAR-011 TAR-016 TAR-018

PAR-015 PAR-014A

220

PLANS APPROVED BY:
DATE:
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ALLEGANY COUNTY, MARYLAND
MINERAL COUNTY, WEST VIRGINIA

XREFS:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-PE-NOTES
HEXAGON
CGTL8000-XCT

IMAGES:
I-68.bmp
L80001.jpg

N

G-03 G-04 G-05 G-06 G-07 G-08 G-09

KEY PLAN

400' 0 400' 800'
1"=400'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

OVERALL KEY PLAN (2 OF 7)

ARCADIS Project No.	CGTL8000.0001
Date	NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-04

X-18
X-20
X-19A
BORE ENTRY
BORE EXIT
X-20
X-22
X-22A
X-23
X-24
X-25A
X-25
PAR-020B
PAR-019
X-19
PAR-020A
220
X-21
X-23
PAR-021
PAR-022
X-24
AR-08
TAR-024
PAR-023
AR-09

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

N

G-09 G-08 G-07 G-06 G-05 G-04 G-03

KEY PLAN

XREFS:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-PL
HEXAGON KEYNOTES
CGTL8000-XPT

IMAGES:
I-68.bmp
L80001.jpg

1"=400' 400' 0 400' 800'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

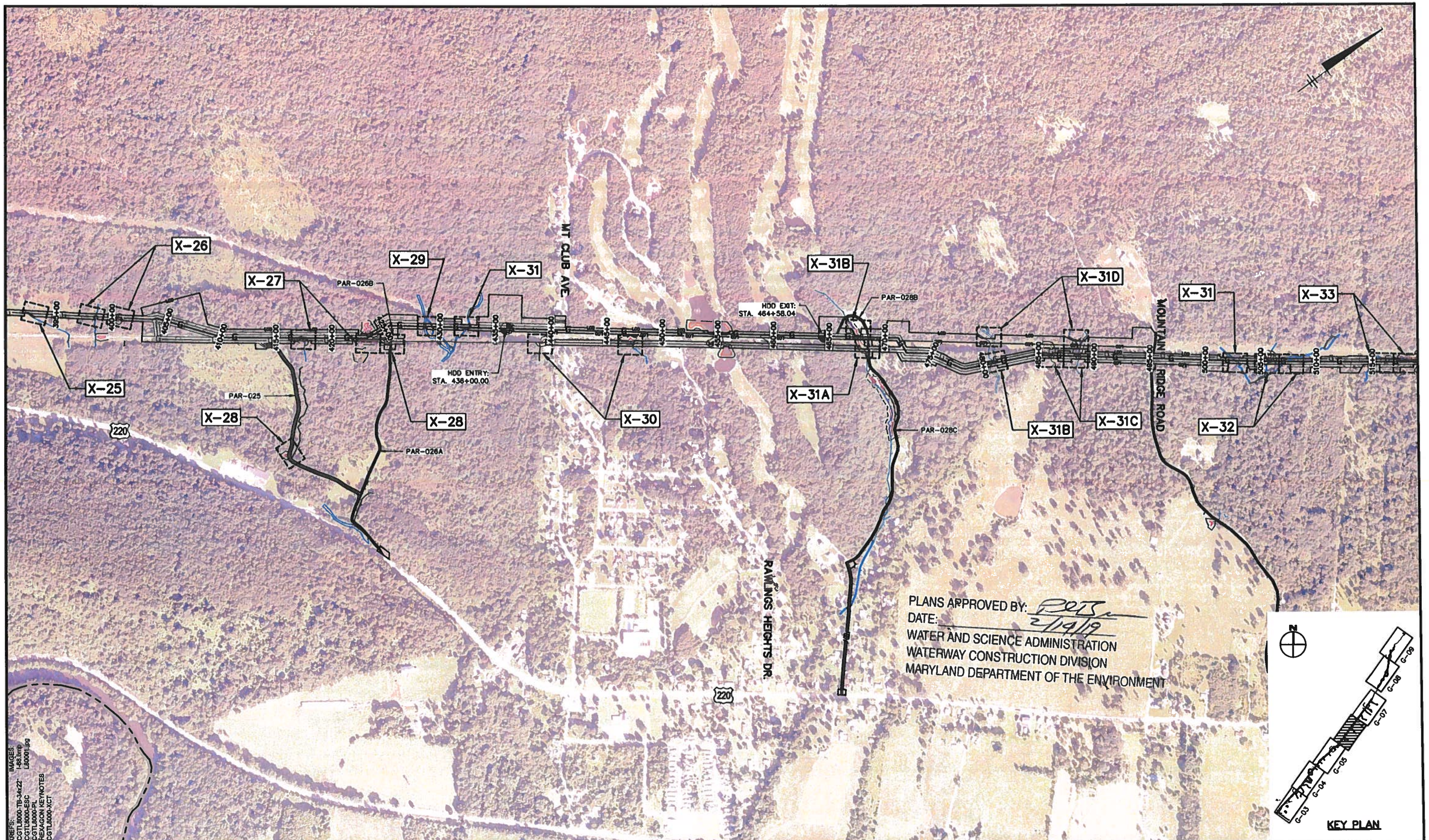
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

OVERALL KEY PLAN (3 OF 7)

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-05



User:TITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\G-03--G-09.DWG Scale:1:1 SavedDate:11/26/2018 Time:16:06 Plot Date: Tittle, Taylor H; 11/26/2018; 16:14 ; Layout:6

XREFS:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-PL
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:
48.bmp
L80001.jpg

400' 0 400' 800'
1"=400'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name
MICHAEL B. HIGGINS
Professional Engineer's No.
MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND
MICHAEL B. HIGGINS
52652
REGISTERED PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

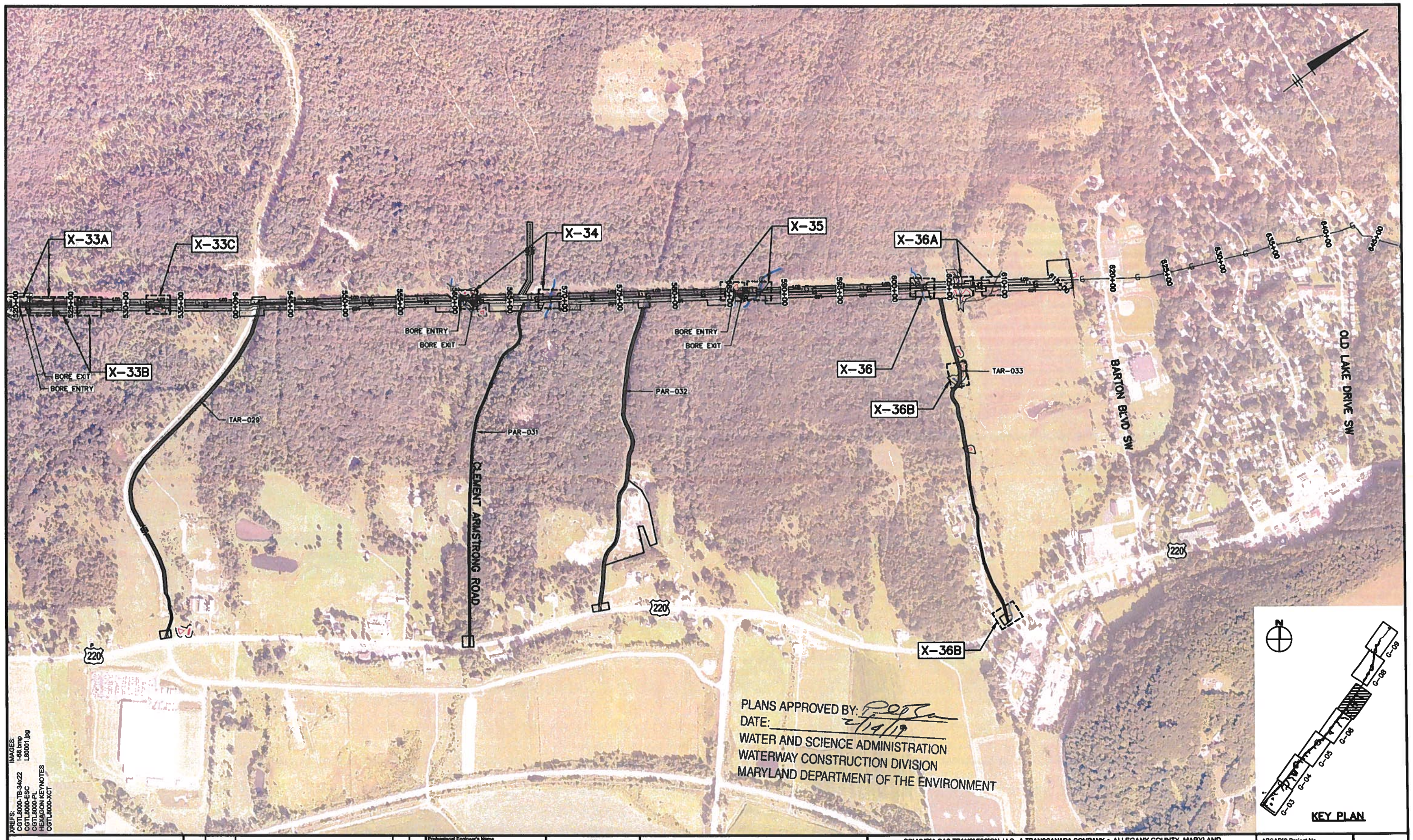
OVERALL KEY PLAN (4 OF 7)

ARCADIS Project No.
CGTL8000.0001

Date
NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-06



User:TTITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\G-03--G-09.DWG Scale:1:1 Saved/Date:11/28/2018 Time:16:06 Plot Date: Tittle, Taylor H; 11/28/2018, 16:18 ; Layout:7

XREFS:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-KEYNOTES
CGTL8000-PLAN
CGTL8000-XCT

IMAGES:
I-68.bmp
L80001.jpg

400' 0 400' 800'
1"=400'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

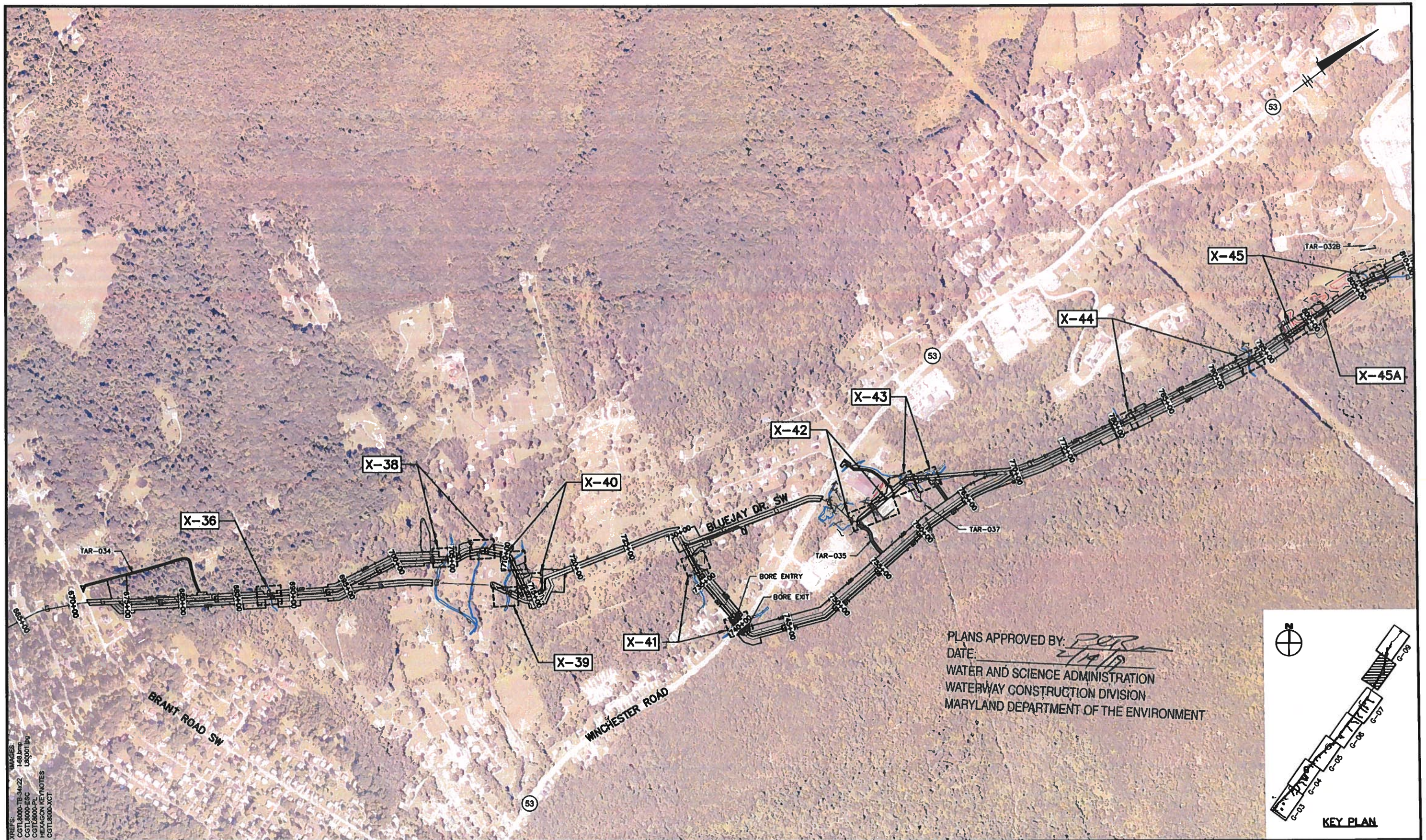
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

OVERALL KEY PLAN (5 OF 7)

ARCADIS Project No.	CGTL8000.0001
Date	NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-07



XREFS: CGTL8000-TB-34x22, CGTL8000-ESC, CGTL8000-PL, REM-8000-KEYNOTES, CGTL8000-XCT
IMAGES: I-68.bmp, L80001.jpg

User:TTITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\G-03--G-09.DWG Scale:1:1 Saved/Date:11/26/2018 Time:16:06 Plot Date: Title, Taylor H: 11/26/2018, 16:19 : Layout8

1"=400' (400' 0 400' 800')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

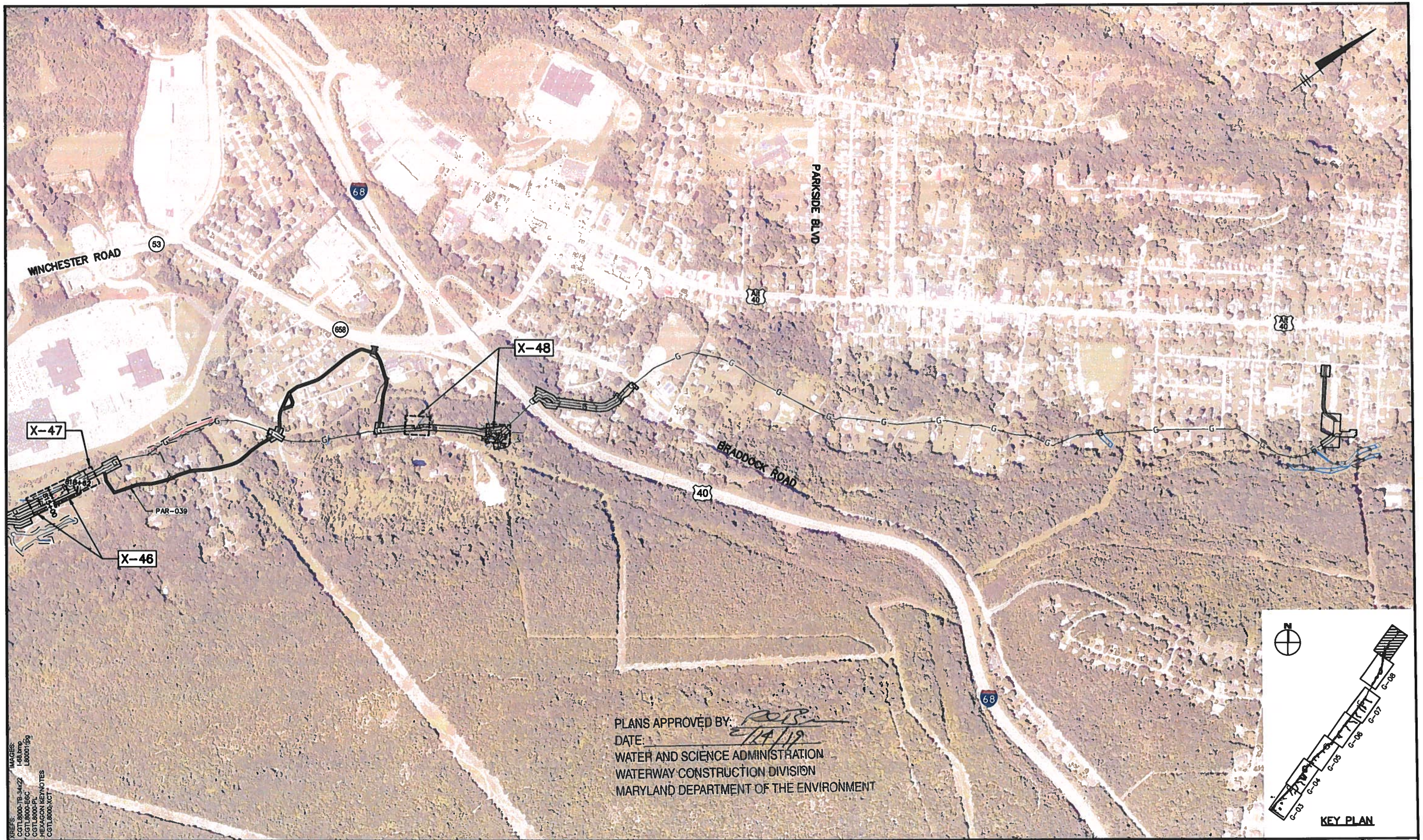
OVERALL KEY PLAN (6 OF 7)

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-08

User:TTITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\G-03--G-09.DWG Scale:1:1 SavedDate:11/26/2018 Time:18:06 Plot Date: Tittle, Taylor H; 11/26/2018; 18:21 ; Layout:9



XREFS:
CGTL8000-TB-34x22
CGTL8000-E&C
CGTL8000-PL
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:
I-68.bmp
L80001.jpg

PLANS APPROVED BY: [signature]
DATE: 1/24/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

1"=400' — 400' 0 400' 800'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS — Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

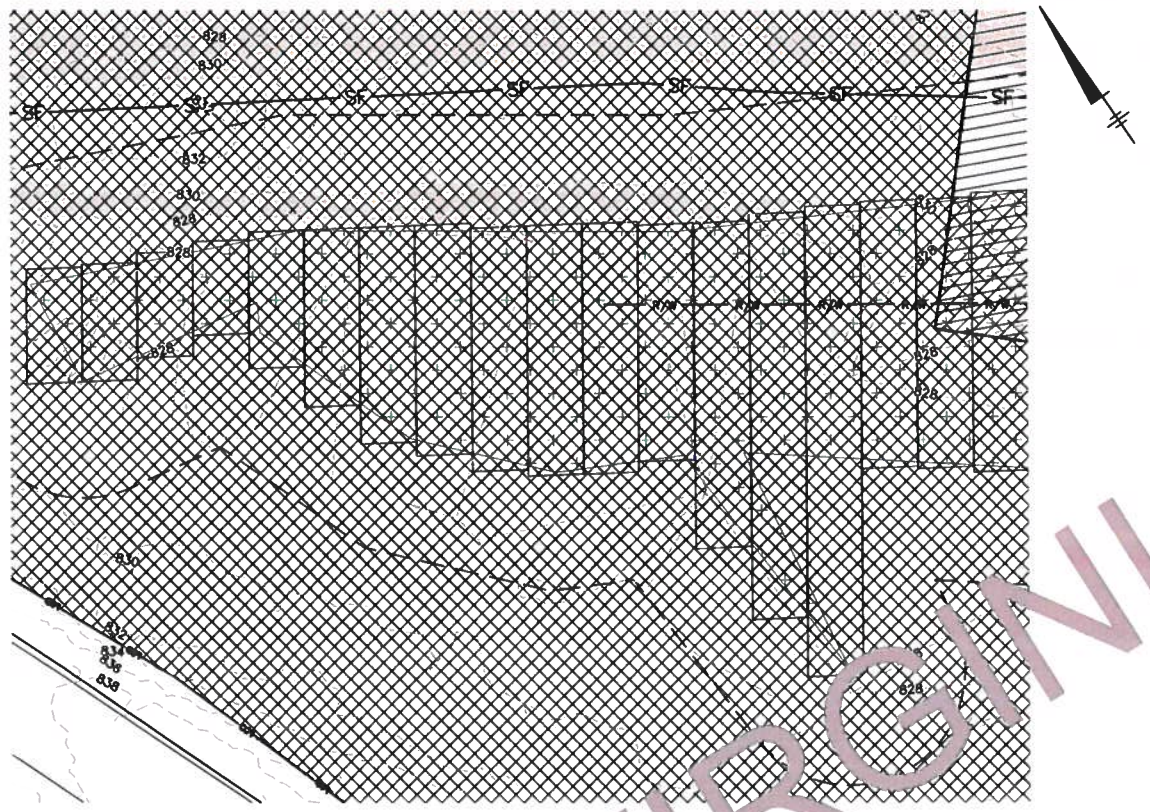
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

OVERALL KEY PLAN (7 OF 7)

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

G-09

9 OF 94



PLAN

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-BR
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

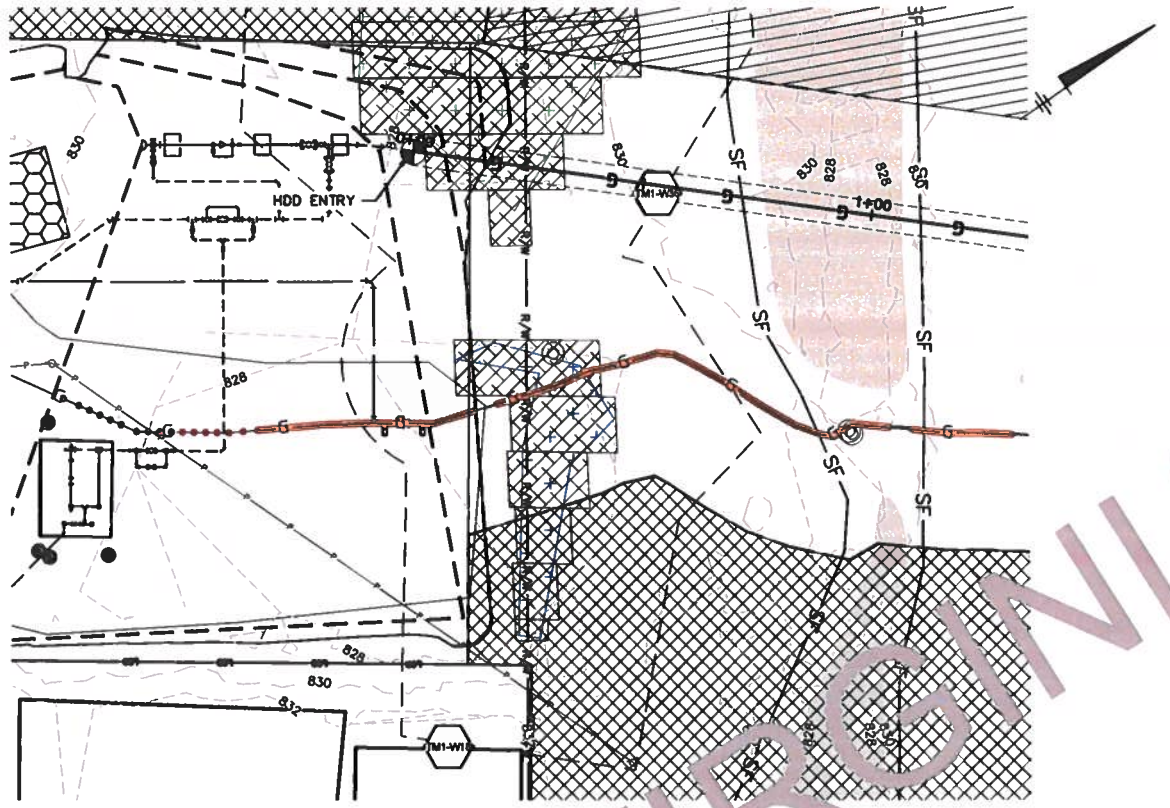
TM1-W36 PLAN

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

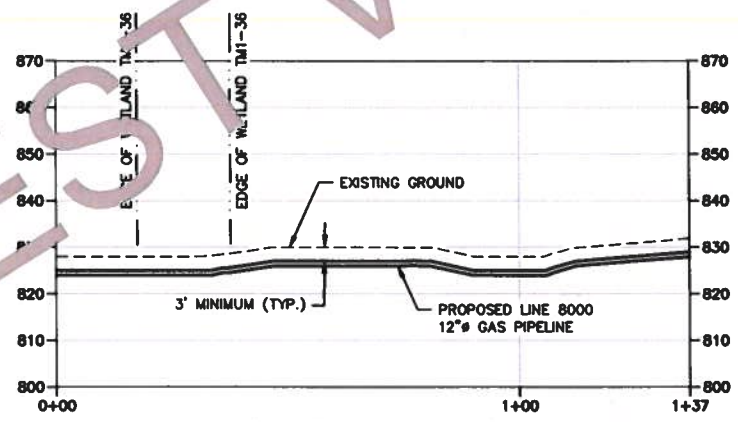
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-01

User:TITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-01.DWG Scale:1:1 SavedDate:11/20/2018 Time:17:16 Plot Date: Tittle, Taylor H. 11/26/2018, 10:16 : Layout:10



PLAN



WETLAND TM1-W36 PROFILE

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
HEXAGON KEYNOTES
CGTL8000-XSECT
CGTL8000-PL

1"=20' (20' 0 20' 40' NOT TO SCALE)

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

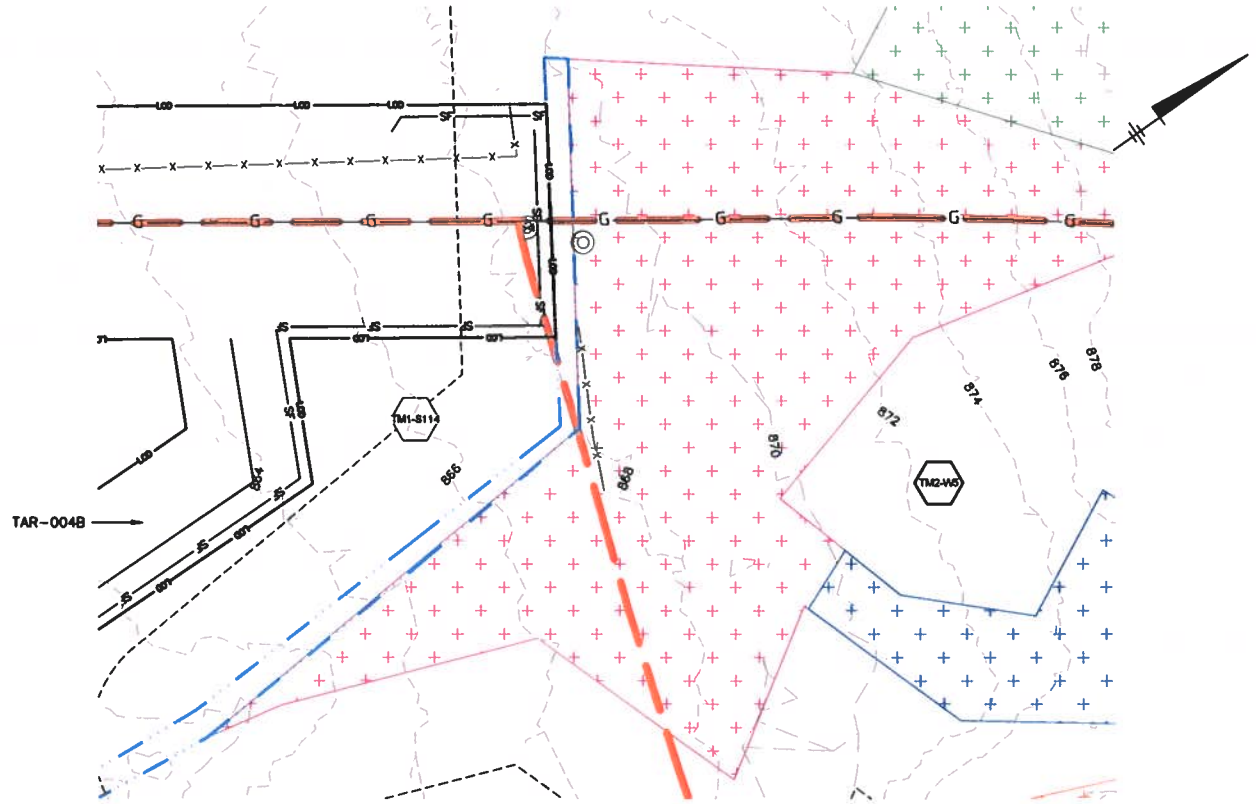
TM1-W18 AND TM1-W36 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

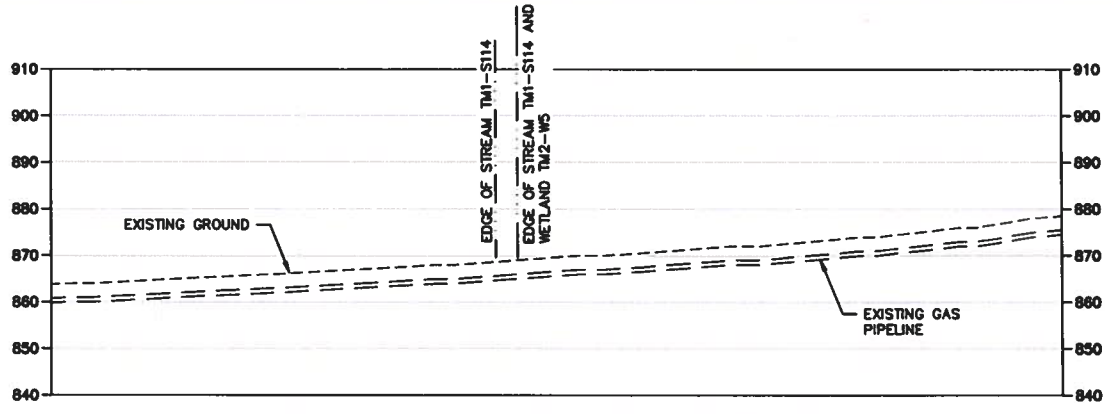
X-02

11 OF 94

User:TTITTLE SpecAUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-02.DWG Scale:1:1 Saved/Date:11/26/2018 Time:10:09 Plot Date: Duggan, Katie; 11/27/2018, 13:04 ; Layout:11



PLAN



EXISTING CROSSING STREAM TM1-S114 AND WETLAND TM2-W5 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-W5	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,011
TM1-S114	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-TC
CGTL8000-BK
IMAGES:
HEXAGON KEYNOTES
CGTL8000-XCT

User:TTITTLE SpecAUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-04.DWG Scale:1:1 SavedDate:11/26/2018 Time:08:46 Plot Date/ Time:08:46 Plot Date/ Time: 11/26/2018, 10:00 ; Layout:12

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSING TM2-W5 AND TM1-S114

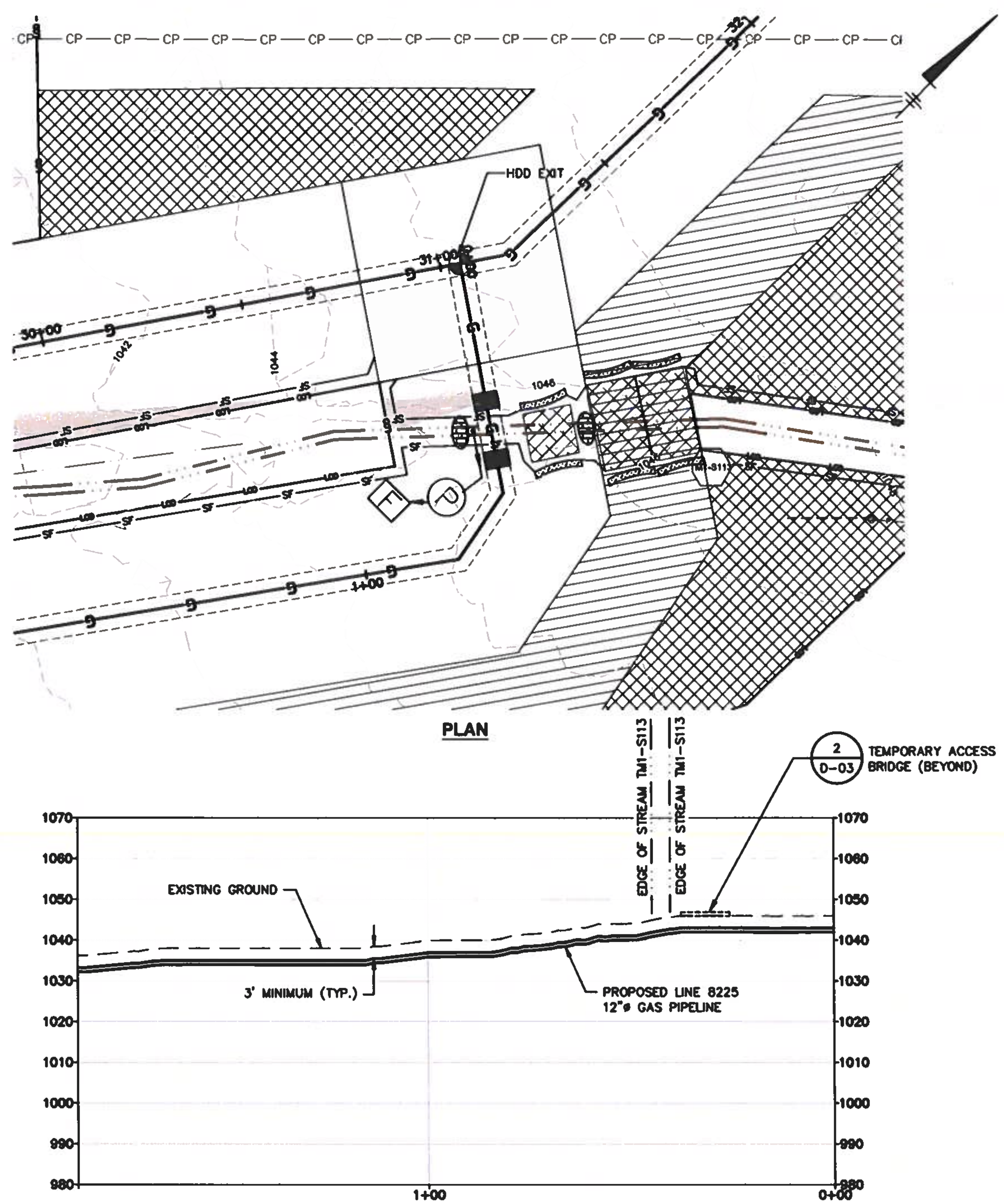
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-04

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-ESC
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:



PLANS APPROVED BY: [signature]
DATE: 2/4/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03) (1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01) (2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S113	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

1"=20' — 20' 0 20' 40'
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS — Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

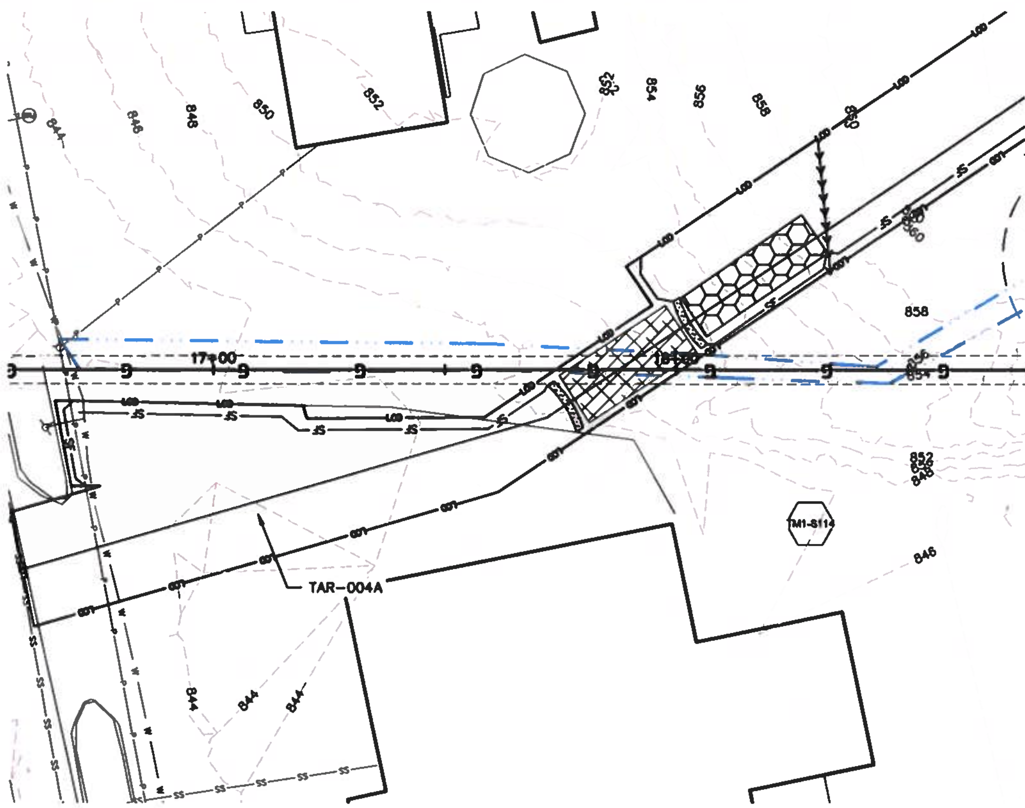
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S113 CROSSING

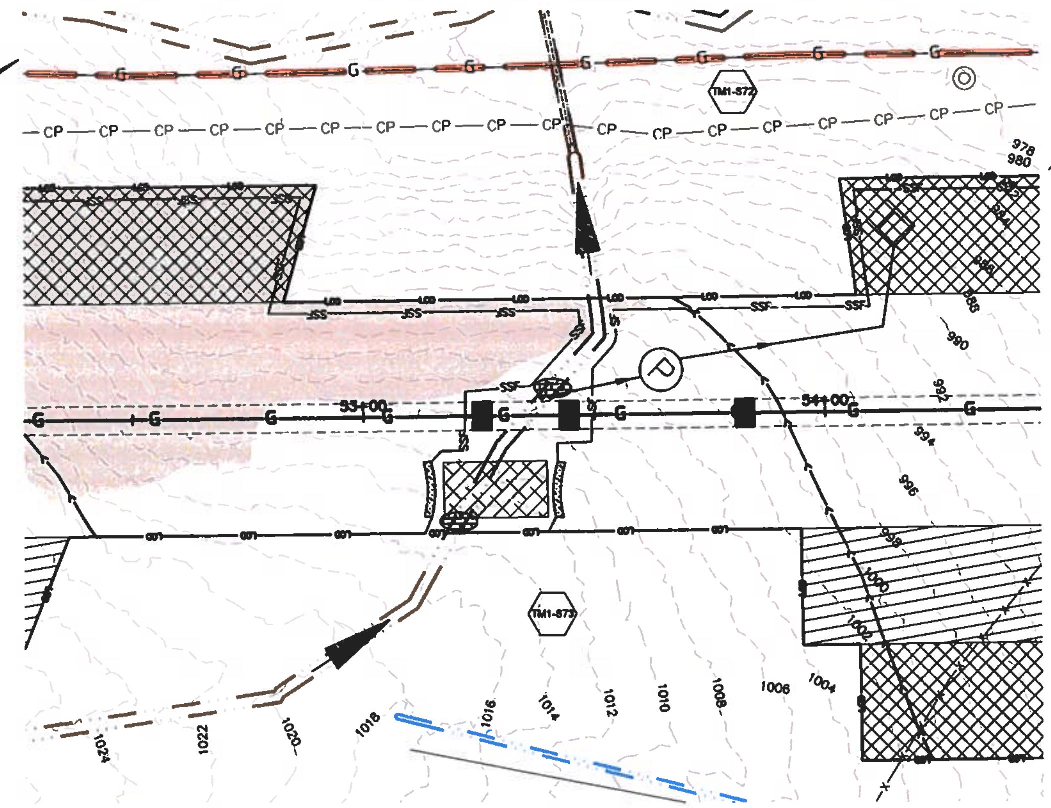
ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-04A

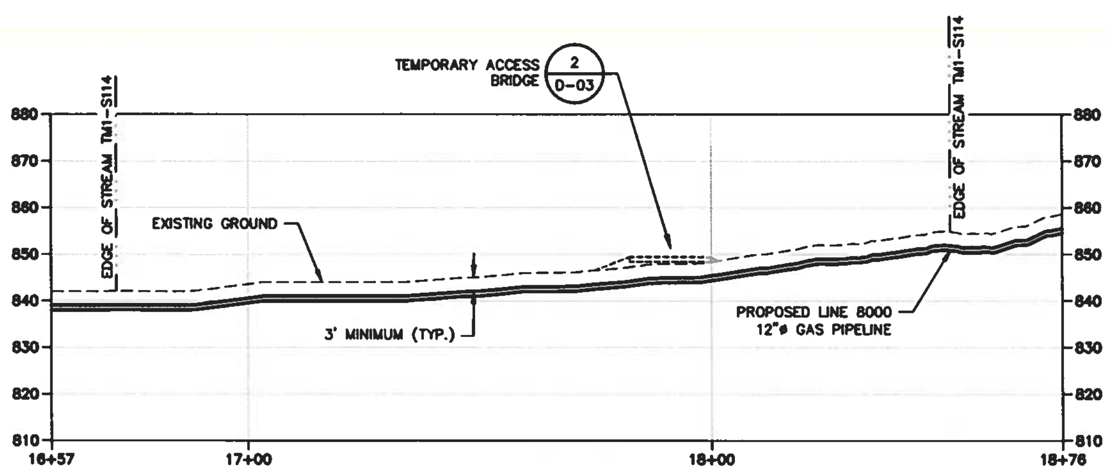
User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-05.DWG Scale:1:1 SavedDate:11/26/2018 Time:09:41 Plot Date: Duggan, Katie; 11/27/2018; 11:01 ; Layout:14



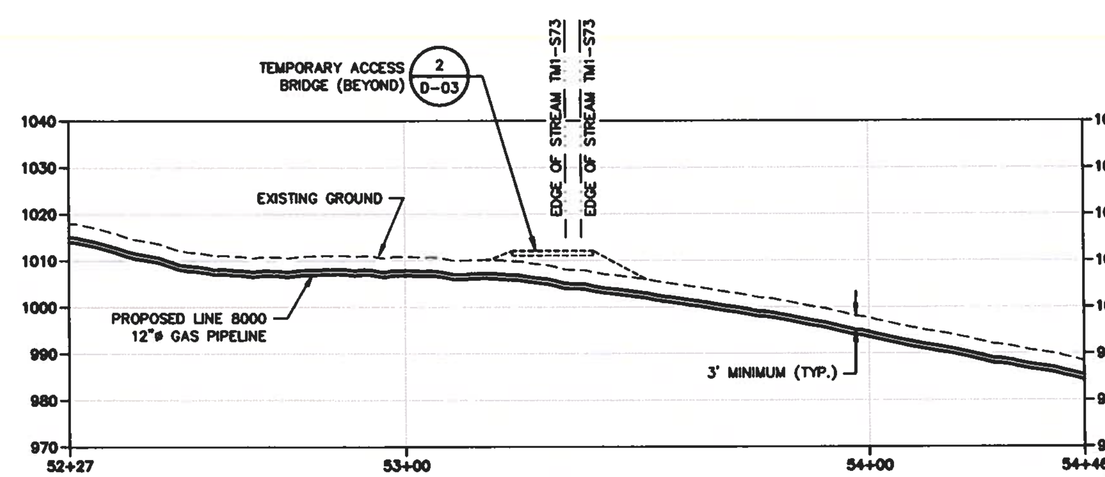
PLAN



PLAN



STREAM TM1-S114 PROFILE



STREAM TM1-S73 PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3, D-01)
- SSF — SUPER SILT FENCE (4, D-01)
- 24 — 24" COMPOST FILTER SOCK (1, D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3, D-03)
- TEMPORARY GABION (3, D-06)
- INTERCEPTOR DIVERSION (1, D-02)
- TRENCH PLUG (2, D-02)
- P — F PUMP AND FILTER BAG (3, D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2, D-03) (1, D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1, D-01) (2, D-01)
- SOIL STABILIZATION MATTING (1, D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2, D-04)
- BROAD-BASED DIP (3, D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S114	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-S73	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-PL, HEXAGON KEYNOTES, CGTL8000-XCT
IMAGES:

1"=20' — 20' 0 20' 40'
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS — Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

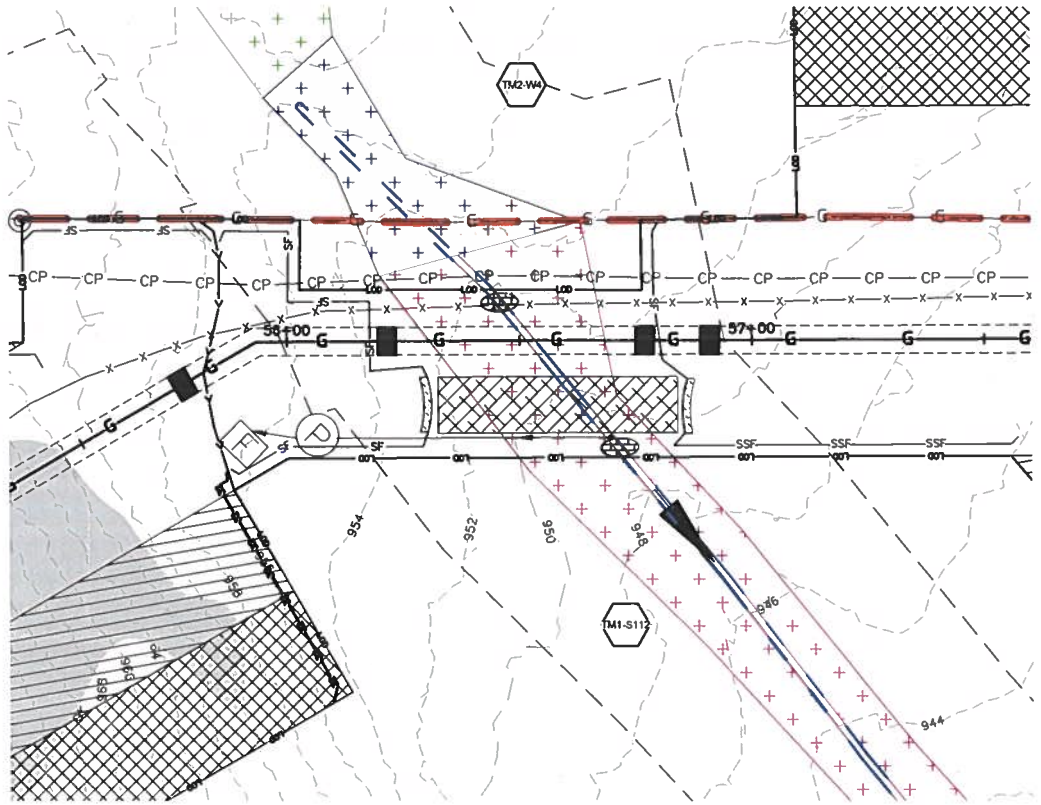
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S114 AND TM1-S73 CROSSINGS

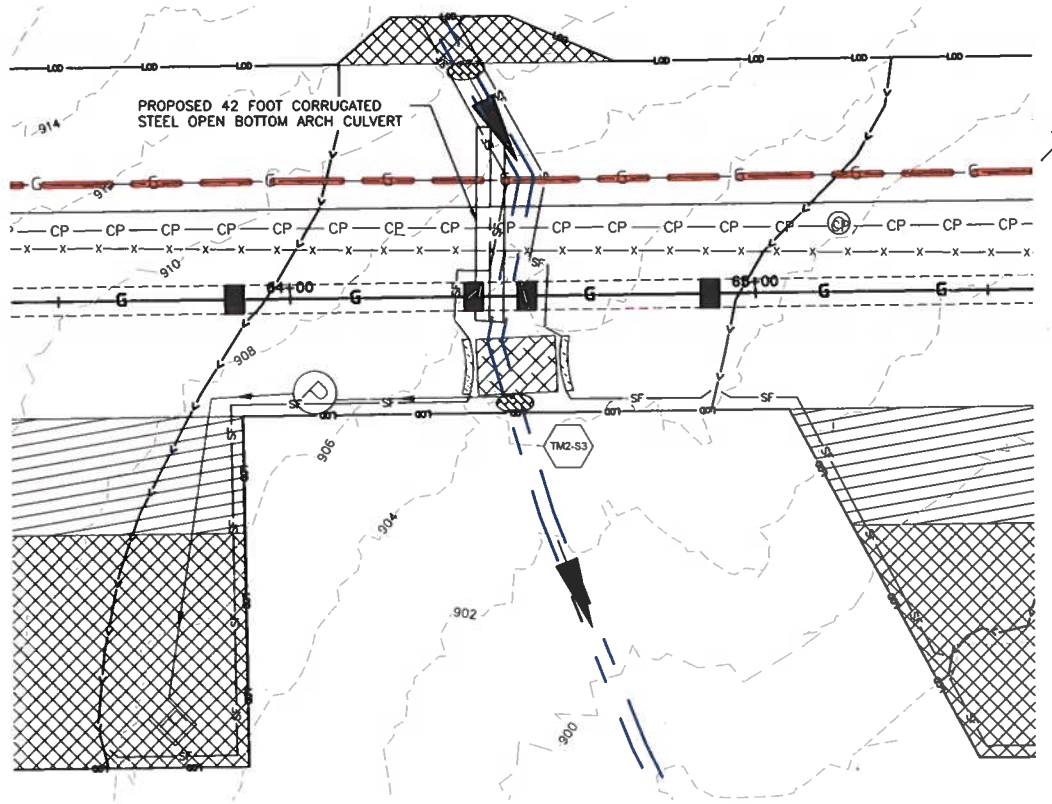
ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC., 50 FOUNTAIN PLAZA, SUITE 600, BUFFALO, NY 14202, Tel. 315.671.9545

X-05

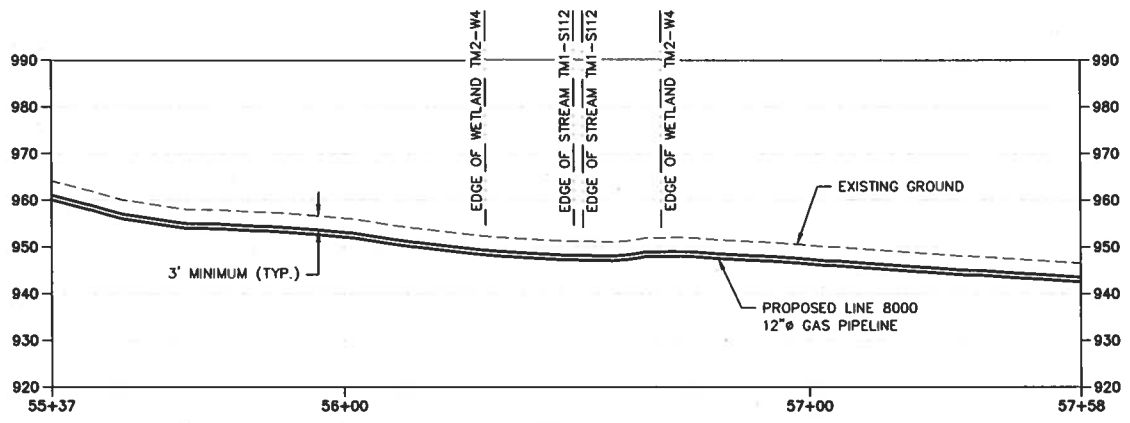
14 OF 94



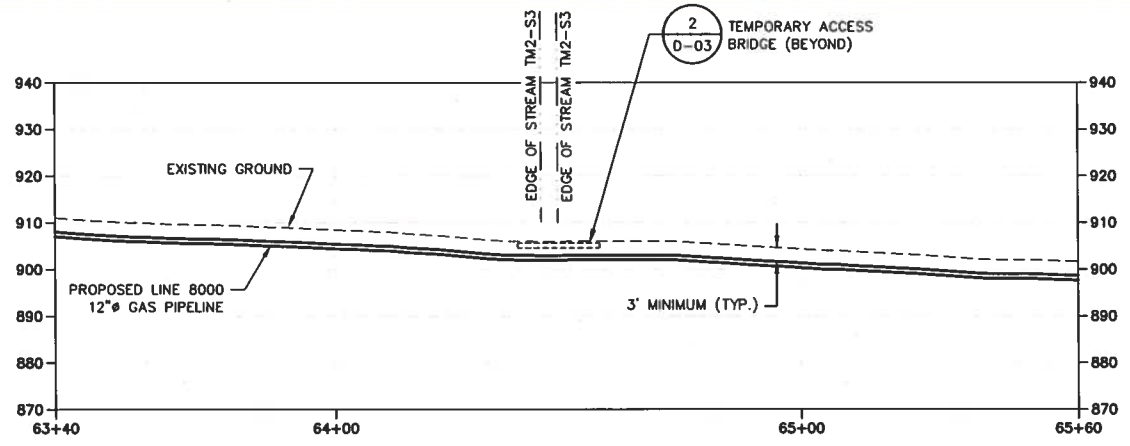
PLAN



PLAN



WETLAND TM2-W4 AND STREAM TM1-S112 PROFILE



STREAM TM2-S3 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary 25-ft Wetland Buffer Impact (sq ft)
TM2-S3 (culvert and pipeline installation)	R4	3	15	45	3	69	207	N/A	483	105	N/A	N/A	N/A
TM2-W4	PEM/PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,206	N/A	N/A
TM1-S112	R4	2	42	84	N/A	N/A	N/A	N/A	N/A	252	N/A	N/A	N/A

Notes.
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01 / 4 D-01)
- SSF — SUPER SILT FENCE
- 24 — 24" COMPOST FILTER SOCK (1 D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03 / 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01 / 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

PLANS APPROVED BY: [signature] DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-XCT, CGTL8000-PL, HEXAGON KEYNOTES_60 Scale, HEXAGON KEYNOTES_20 Scale
IMAGES:

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

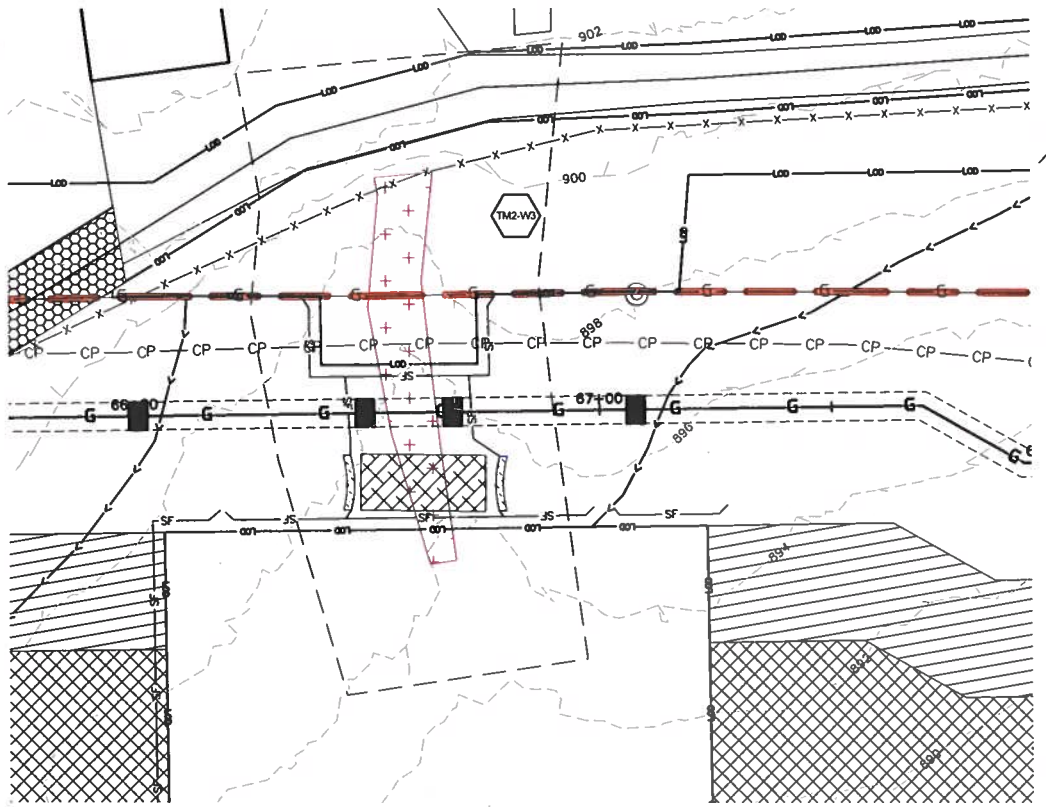
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-W4 AND TM2-S3 CROSSINGS

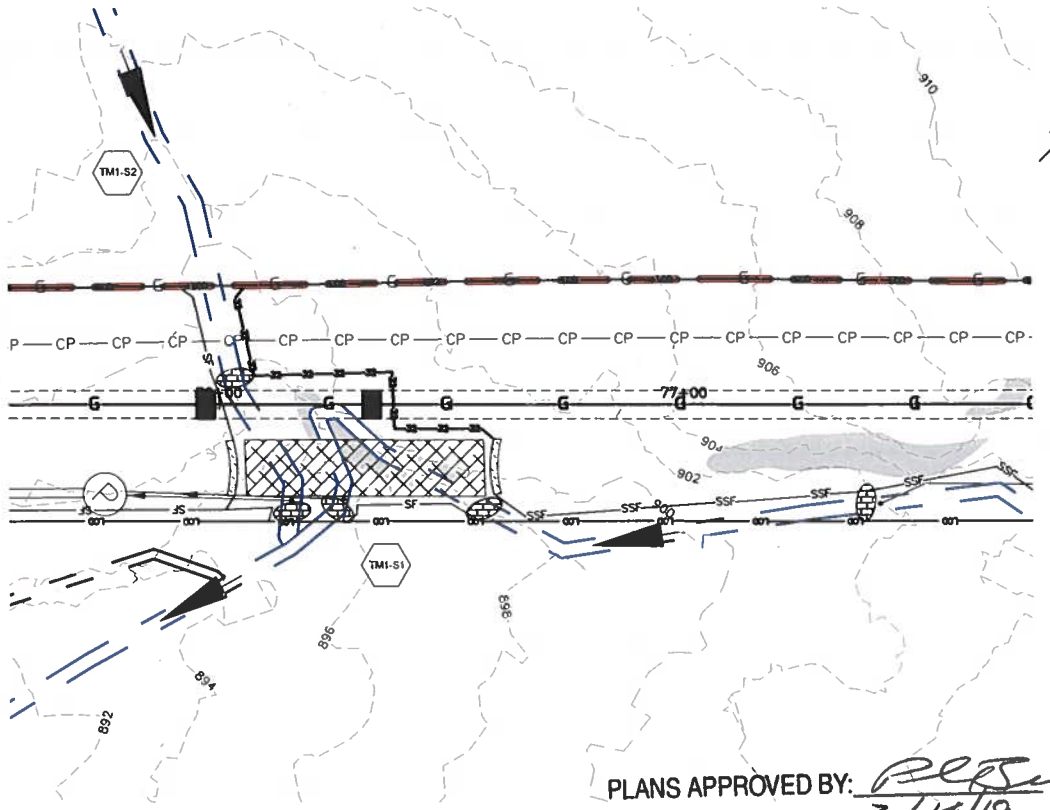
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-06

15 OF 94



PLAN

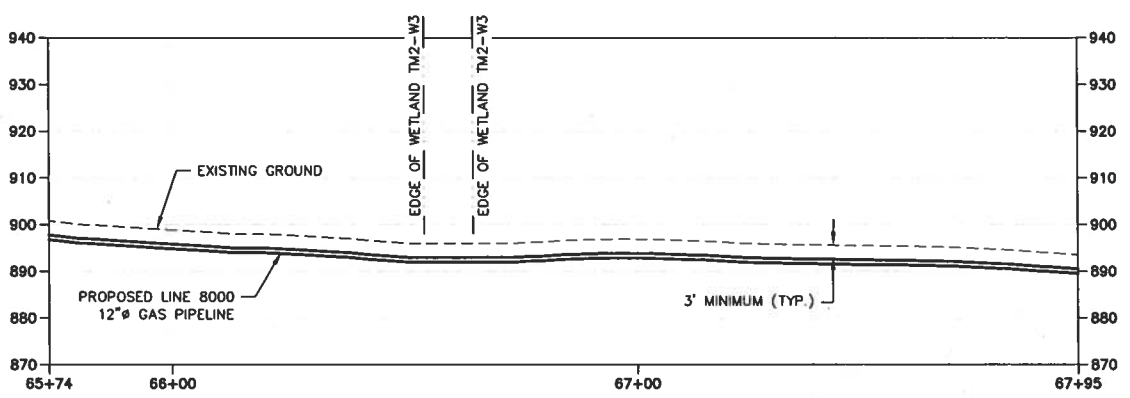


PLAN

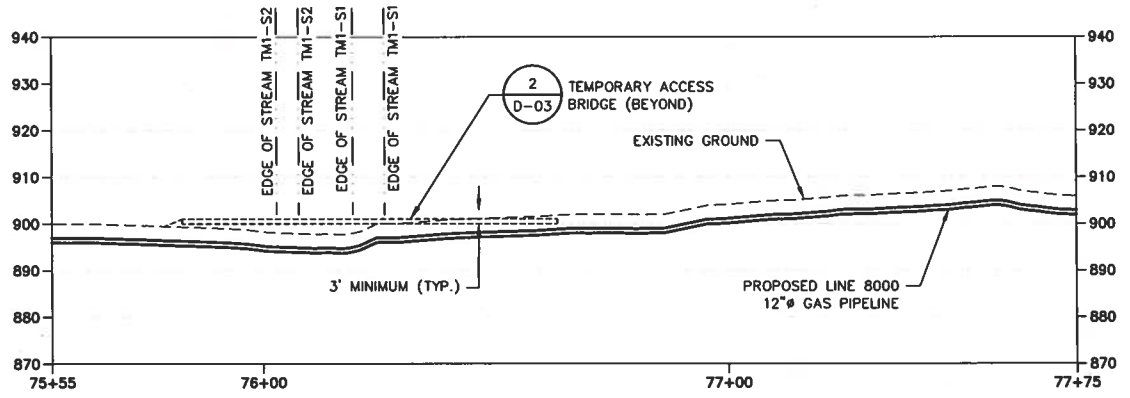
PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



WETLAND TM2-W3 PROFILE



STREAM TM1-S2 AND STREAM TM1-S1 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S2	R4	2	32	64	N/A	N/A	N/A	N/A	N/A	500	N/A	N/A	N/A
TM2-W3	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	334	N/A	3,037
TM1-S1 (west diversion)	R4	3	65	195	N/A	N/A	N/A	N/A	N/A	600	N/A	N/A	N/A
TM1-S1 (east diversion)	R4	3	219	657	N/A	N/A	N/A	N/A	N/A	3000	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-XCT, CGTL8000-PL
IMAGES: HEXAGON KEYNOTES_60 Scale, HEXAGON KEYNOTES_20 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

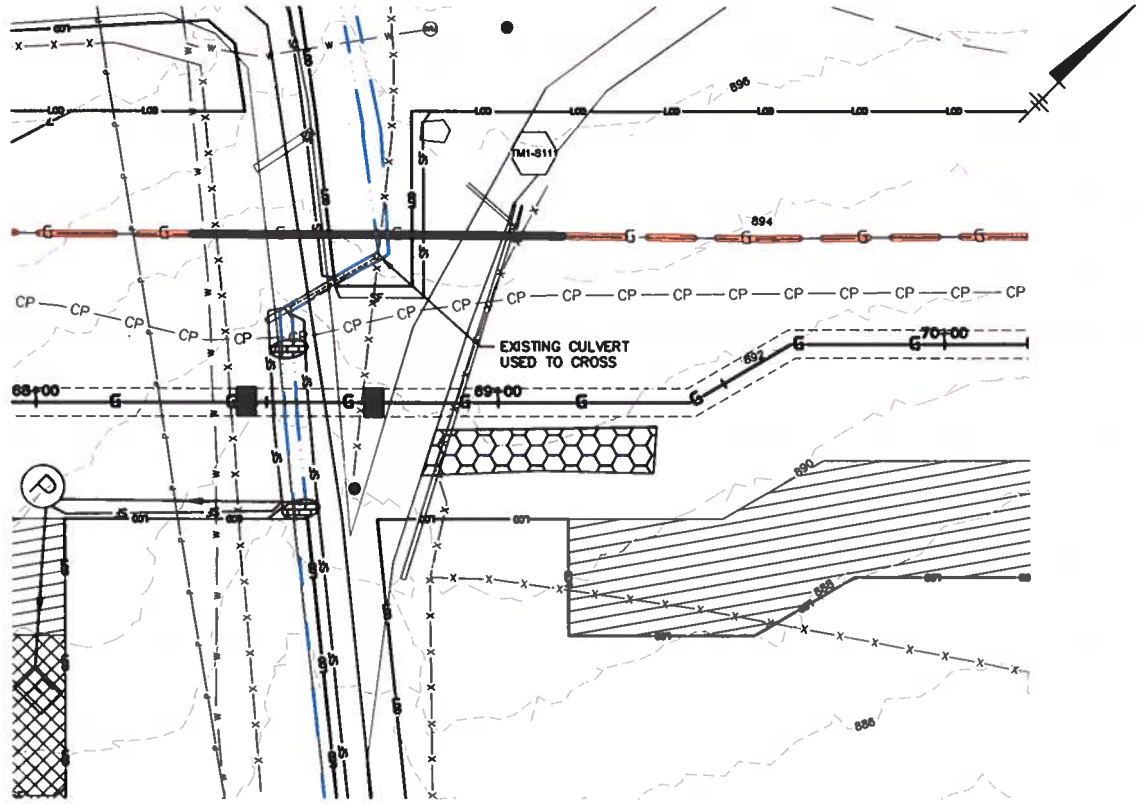
TM2-W3, TM1-S1, AND TM1-S2 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel: 315.671.9545

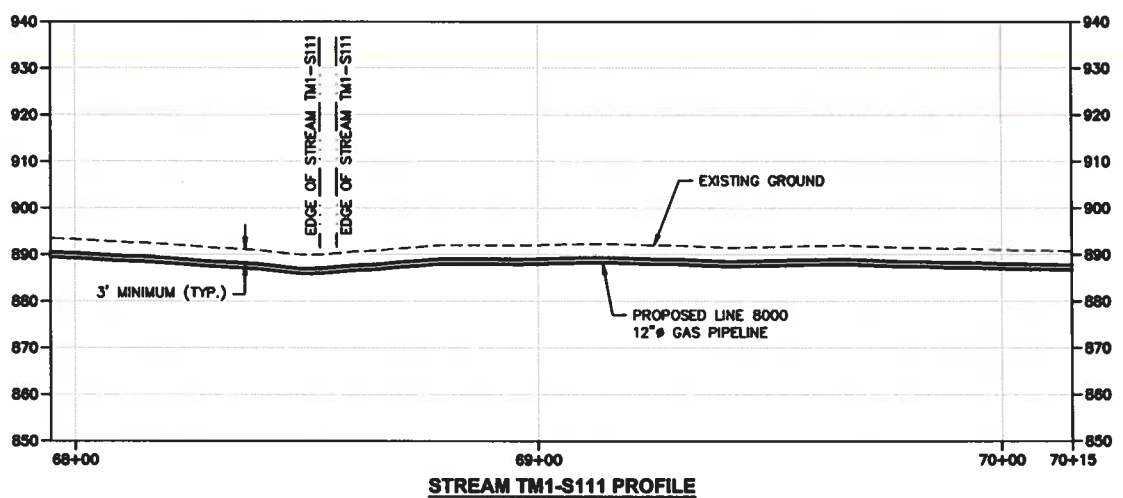
X-07

16 OF 94

User:TTITTLE SpecAUS-NCSMOD File:G:\CADD\ACAD\PRO\ACGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-07.DWG Scale:1:1 SavedDate:11/26/2018 Time:10:39 Plot Date: Steele, Sam; 12/11/2018; 13:59 ; Layout:16



PLAN



STREAM TM1-S111 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S111	R4	3	39	117	N/A	N/A	N/A	N/A	126	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-ESC
CGTL8000-XCT
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

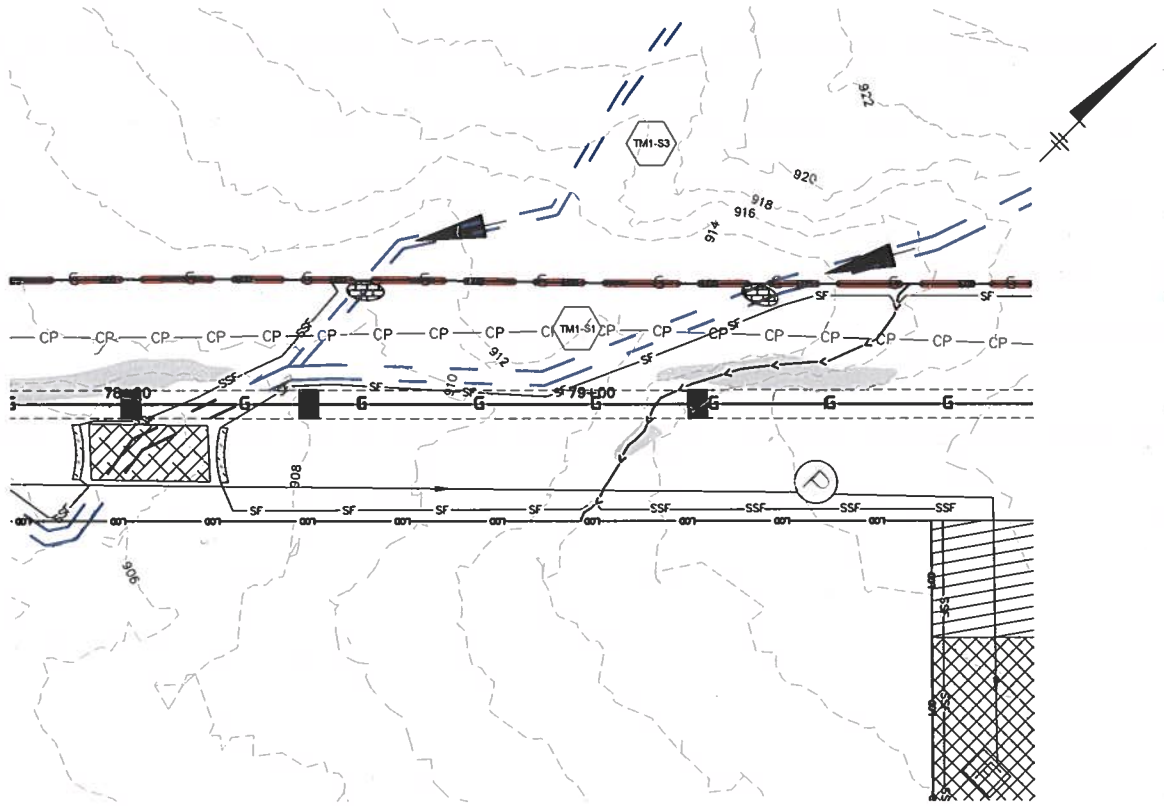
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

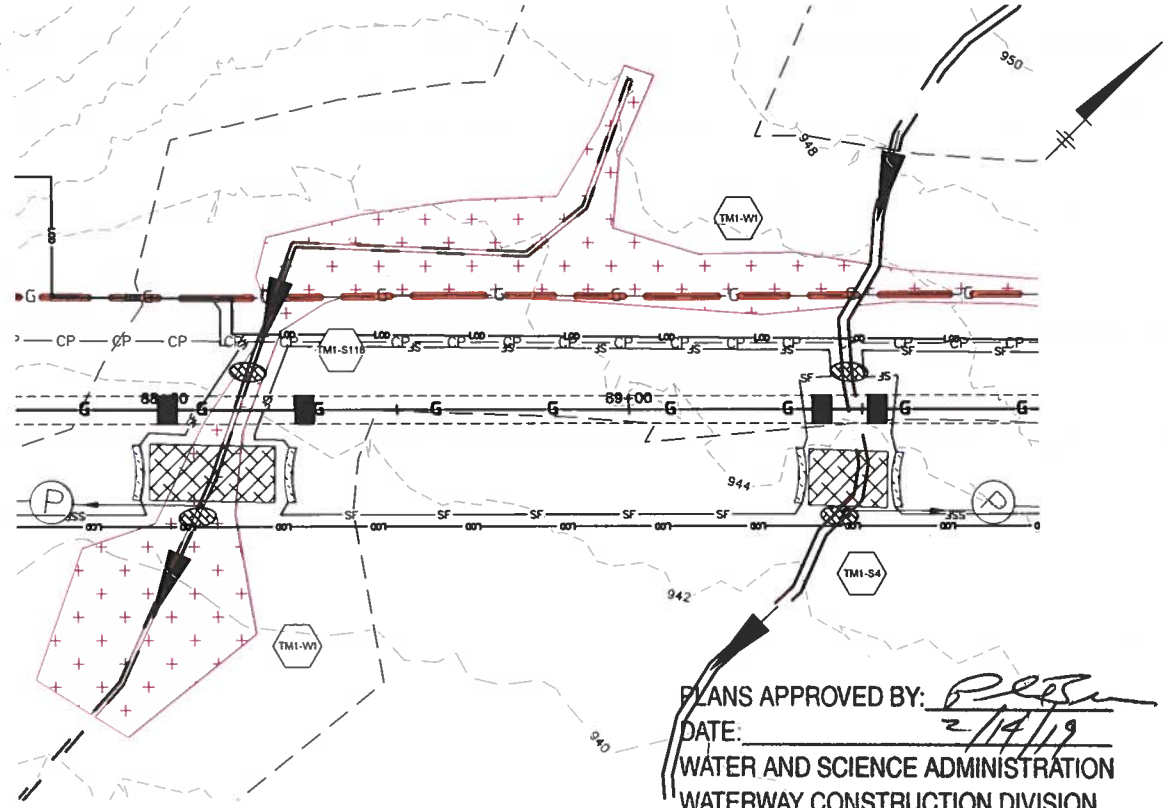
TM1-S111 CROSSING

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-07A

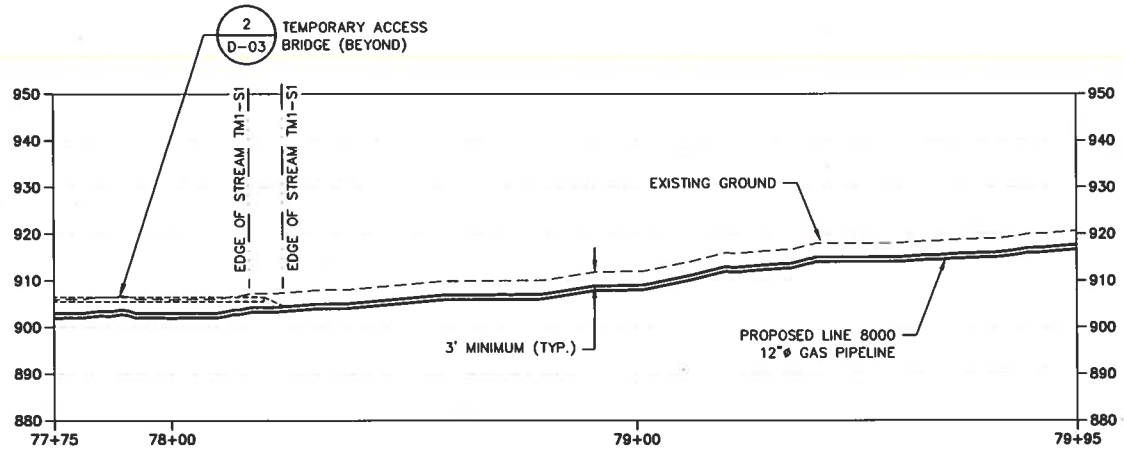




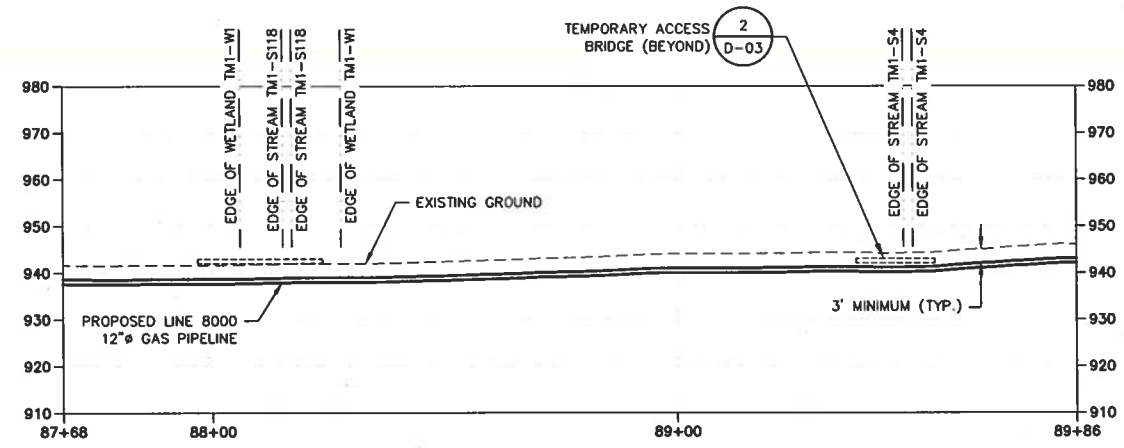
PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



STREAM TM1-S1 PROFILE



STREAM TM1-S4 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S1 (east diversion)	R4	3	219	657	N/A	N/A	N/A	N/A	N/A	3000	N/A	N/A	N/A
TM1-S3	R4	3	24	72	N/A	N/A	N/A	N/A	N/A	360	N/A	N/A	N/A
TM1-S4	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-W1	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	367	N/A	6,125
TM1-S118	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-24x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-PL, CGTL8000-XCT
IMAGES: HEXAGON KEYNOTES_50 Scale, HEXAGON KEYNOTES_20 Scale

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACADPROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-08.DWG Scale:1:1 SavedDate:11/27/2018 Time:10:34 Plot Date: Steele, Sam, 12/11/2018, 16:48 , Layout:18

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

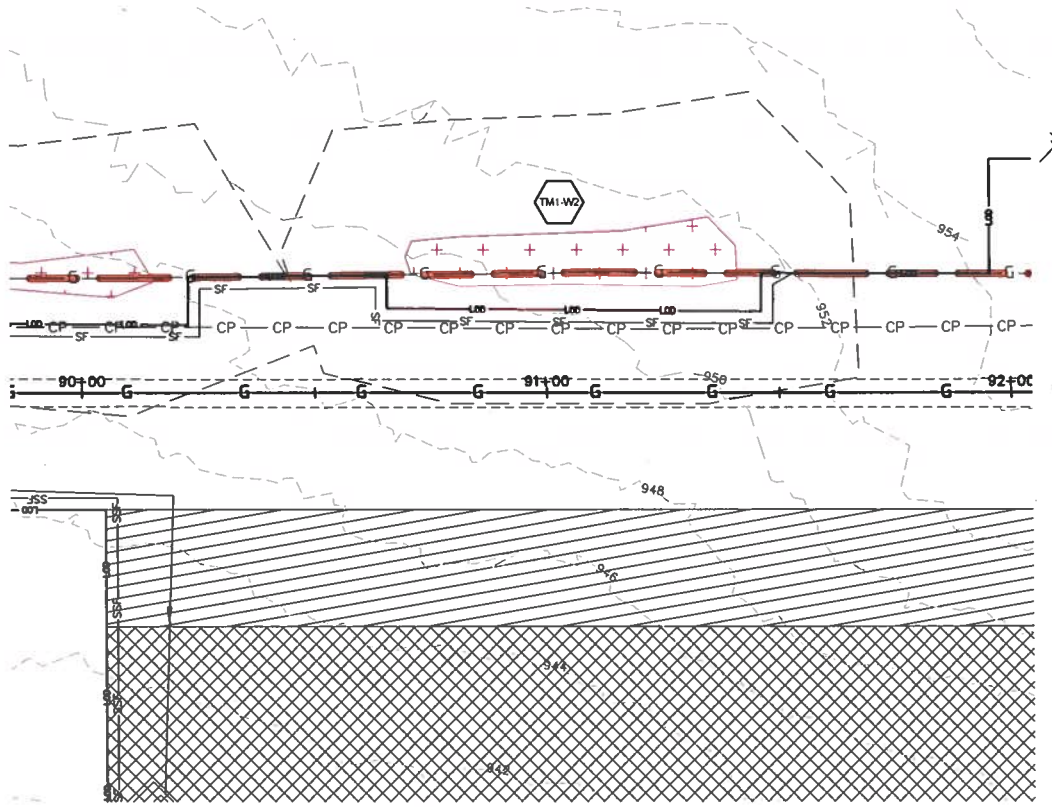
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

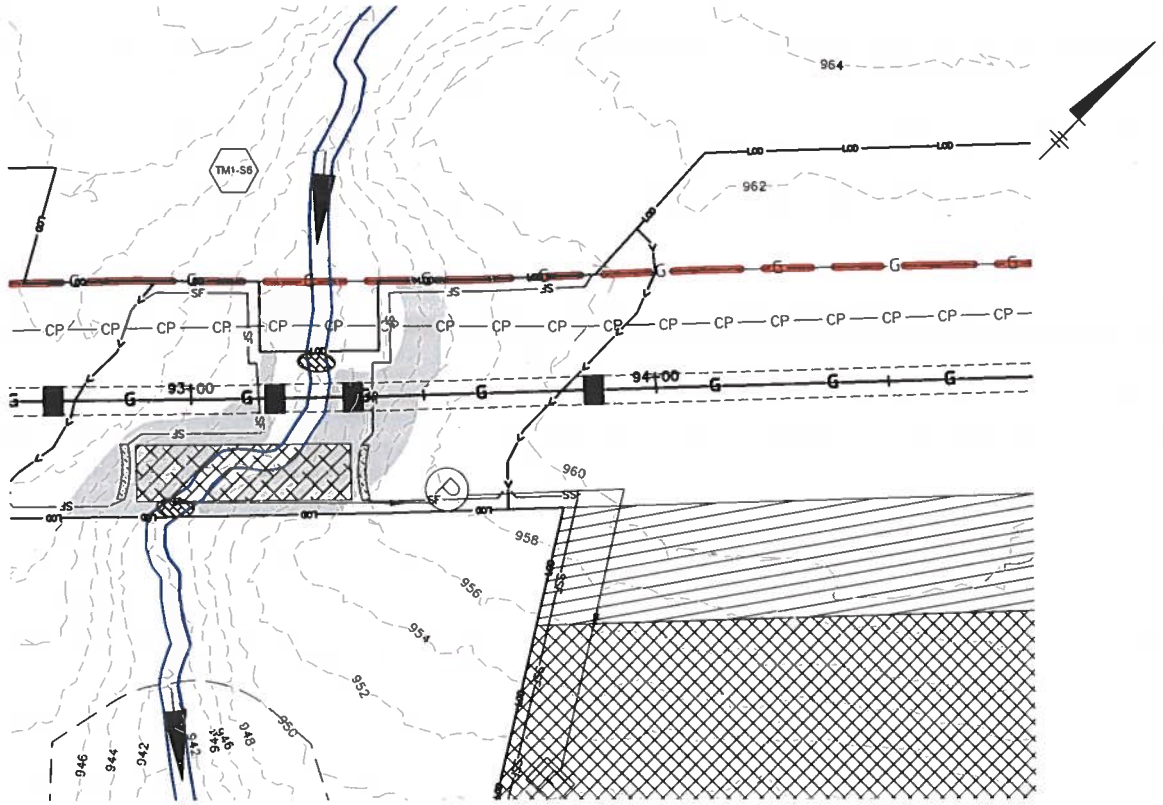
TM1-S1, TM1-S3, TM1-W1, AND TM1-S4 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-08

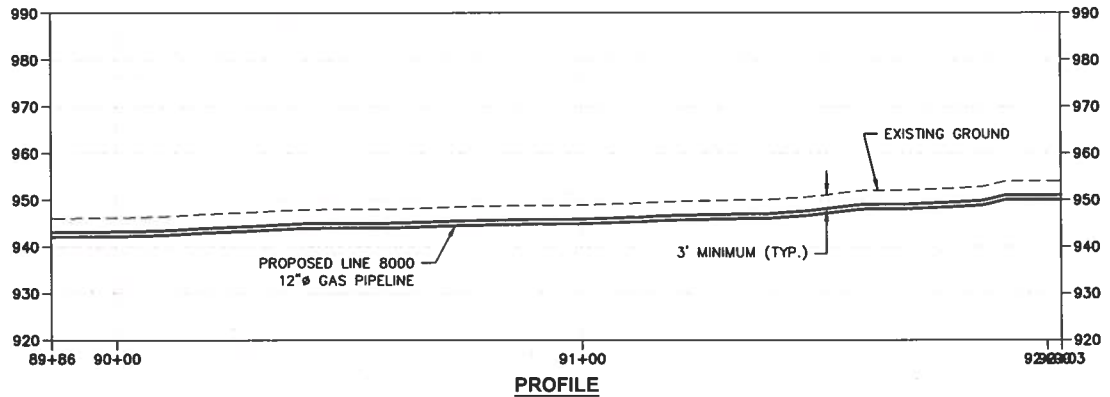


PLAN

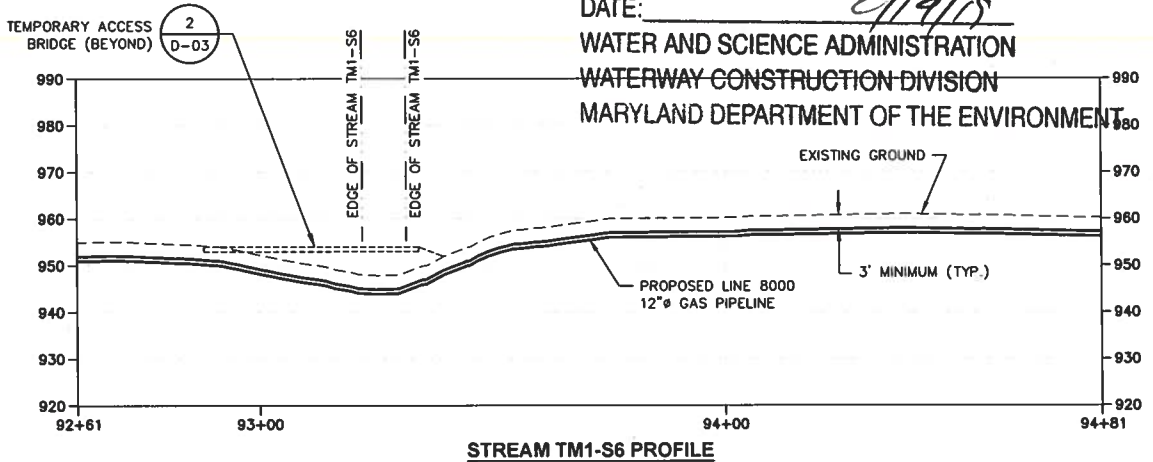


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



STREAM TM1-S6 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S6	R4	4	52	208	N/A	N/A	N/A	N/A	N/A	676	N/A	N/A	N/A
TM1-W2	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2,299

Notes.
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-XCT
HEXAGON KEYNOTES_20 Scale
HEXAGON KEYNOTES_60 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

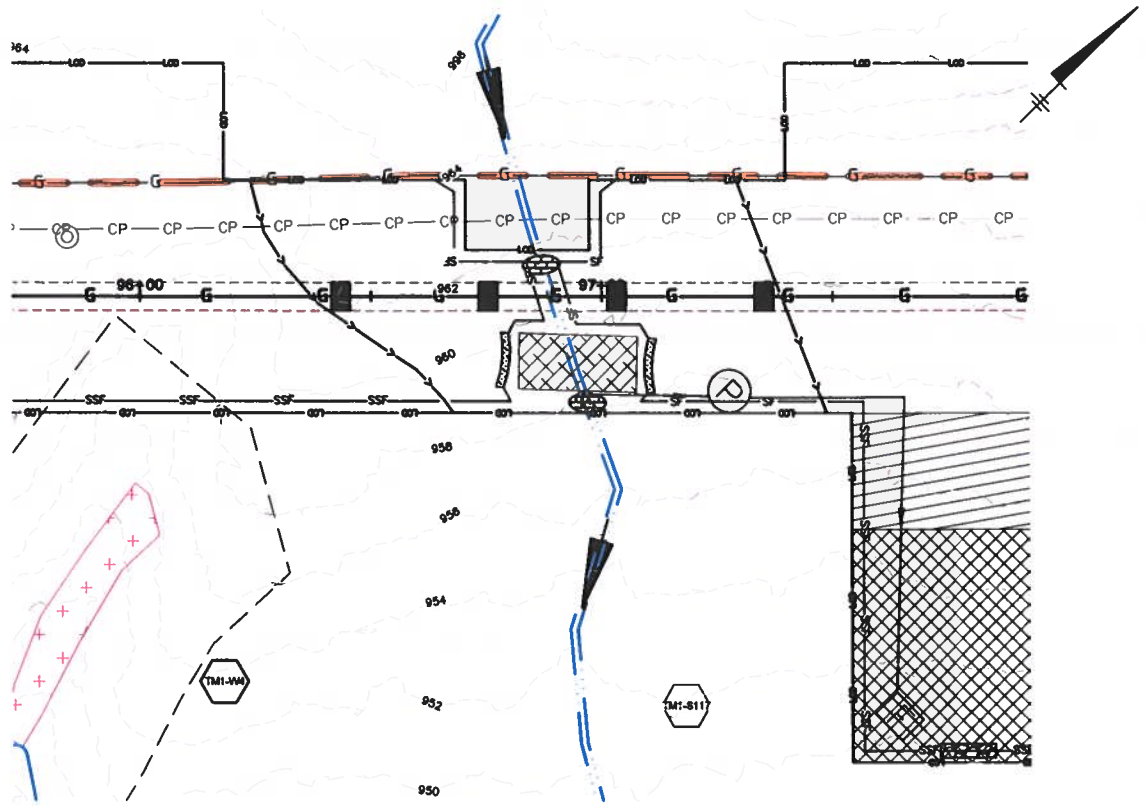
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-W2 AND TM1-S6 CROSSINGS

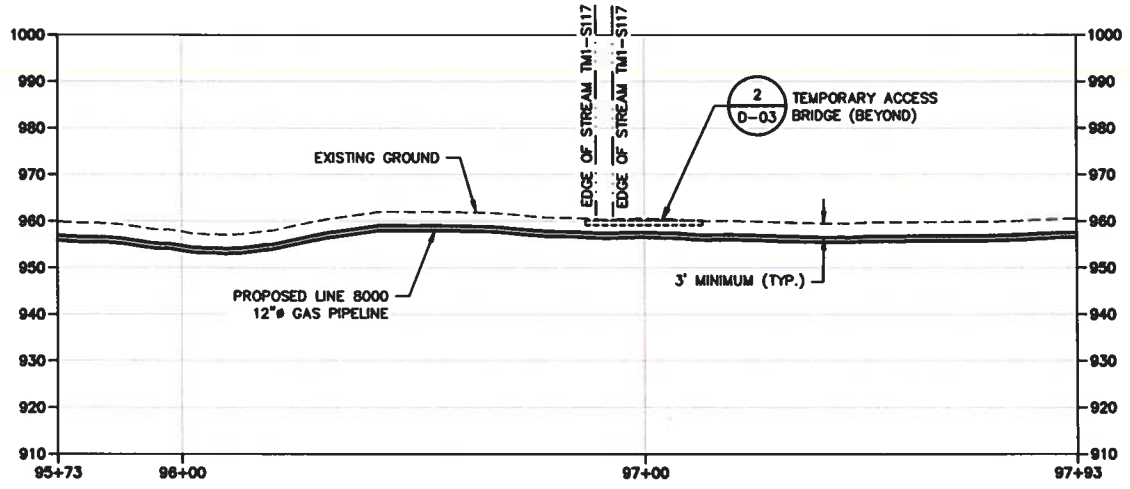
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-09



PLAN



STREAM TM1-S117 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S117	R4	2	33	66	N/A	N/A	N/A	N/A	297	N/A	N/A	N/A
TM1-W4	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	277

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-SC
CGTL8000-XCT
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

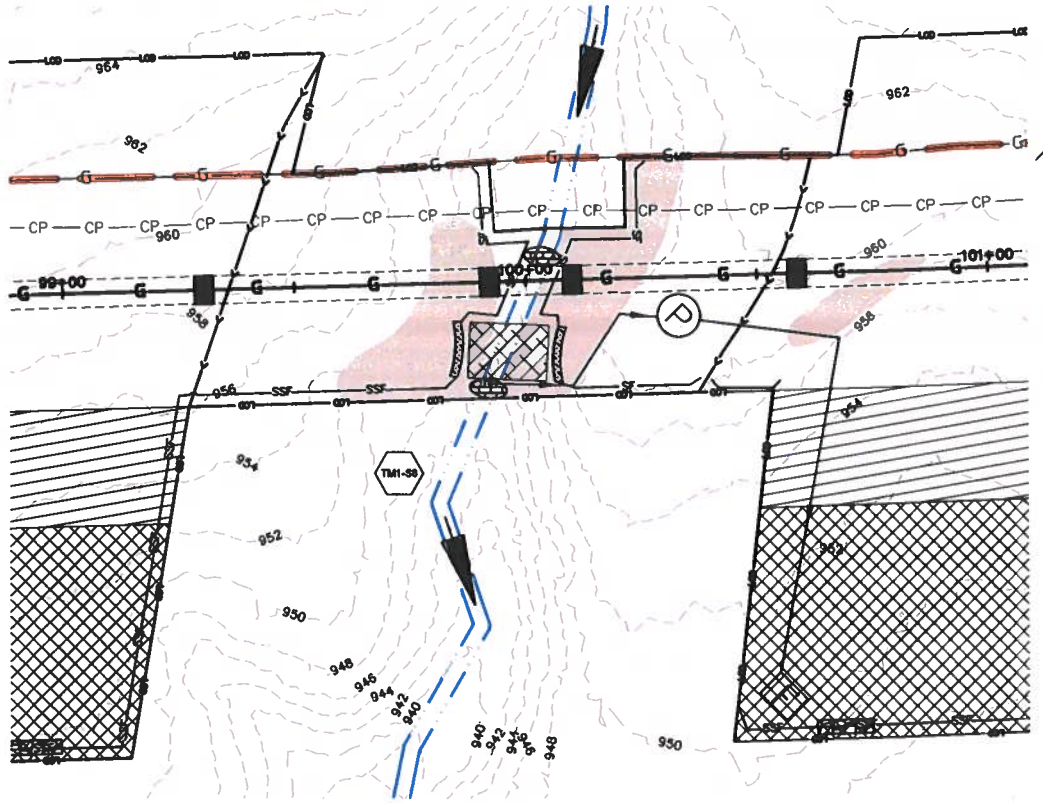
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S117 CROSSING

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 800 BUFFALO, NY 14202 Tel. 315.671.9545

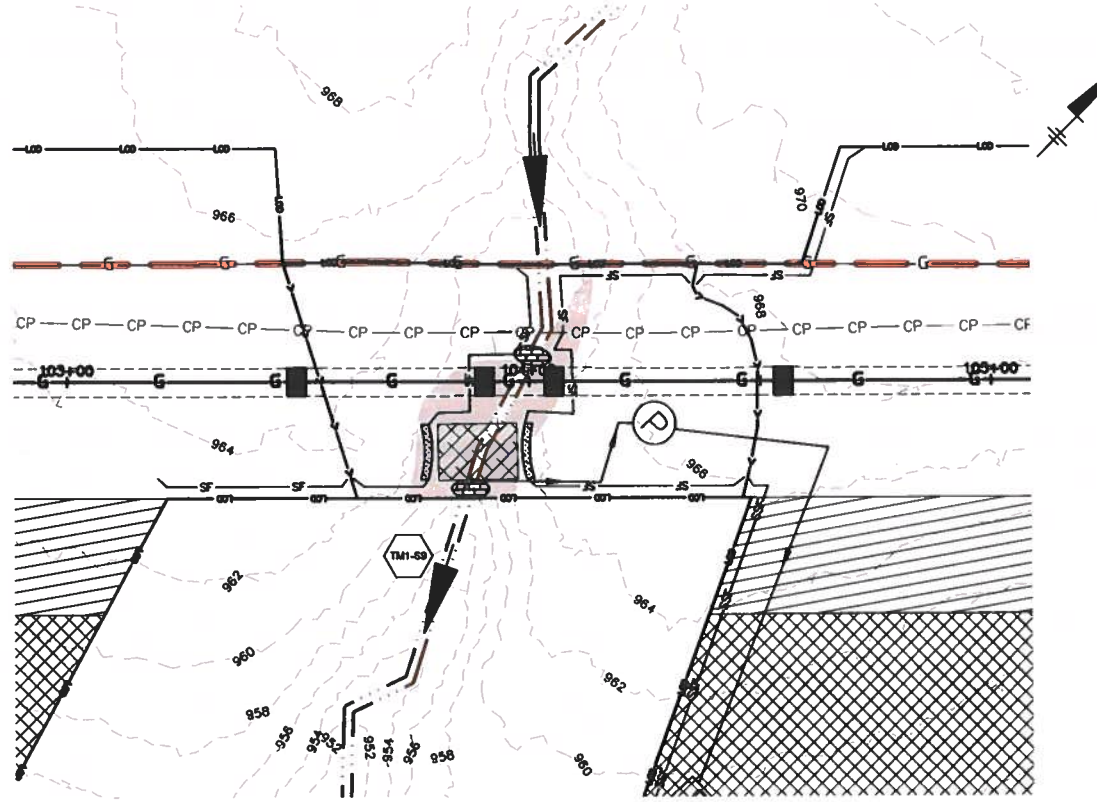
X-09A

20 OF 94



PLAN

STREAM TM1-S8 PROFILE



PLAN

STREAM TM1-S9 PROFILE

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
~~WATERWAY CONSTRUCTION DIVISION~~
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S8	R4	4	32	112	N/A	N/A	N/A	N/A	414	N/A	N/A	N/A
TM1-S9	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PI
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Chd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

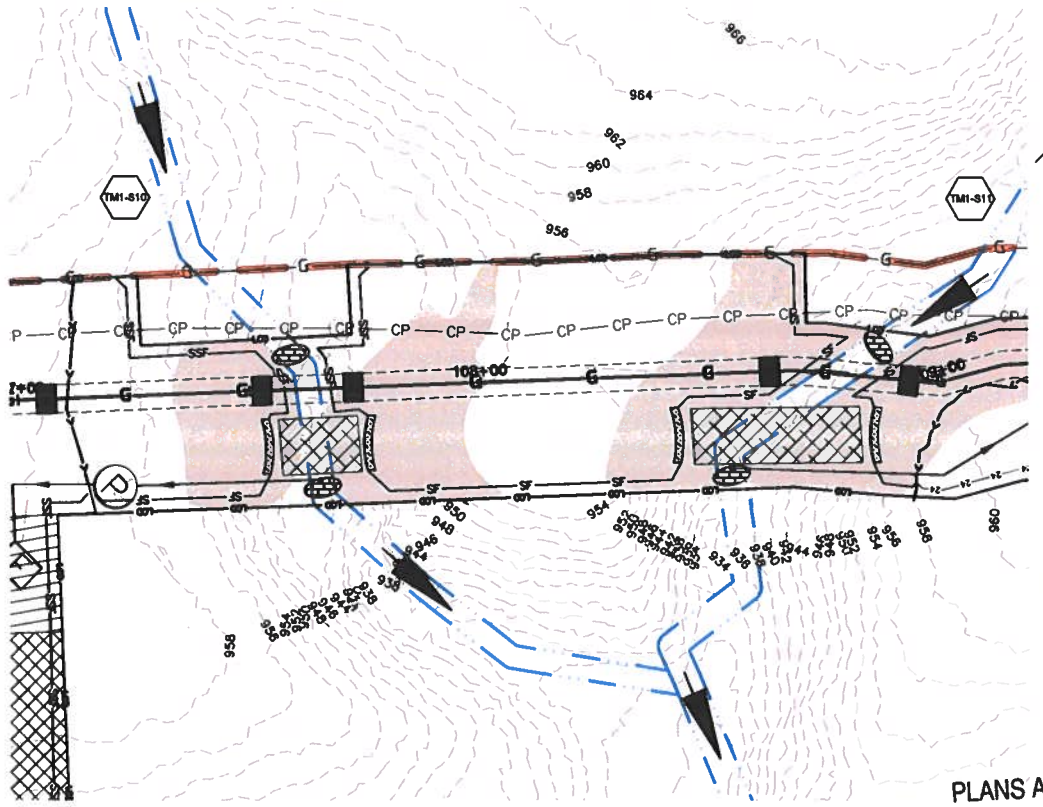
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S8 AND TM1-S9 CROSSINGS

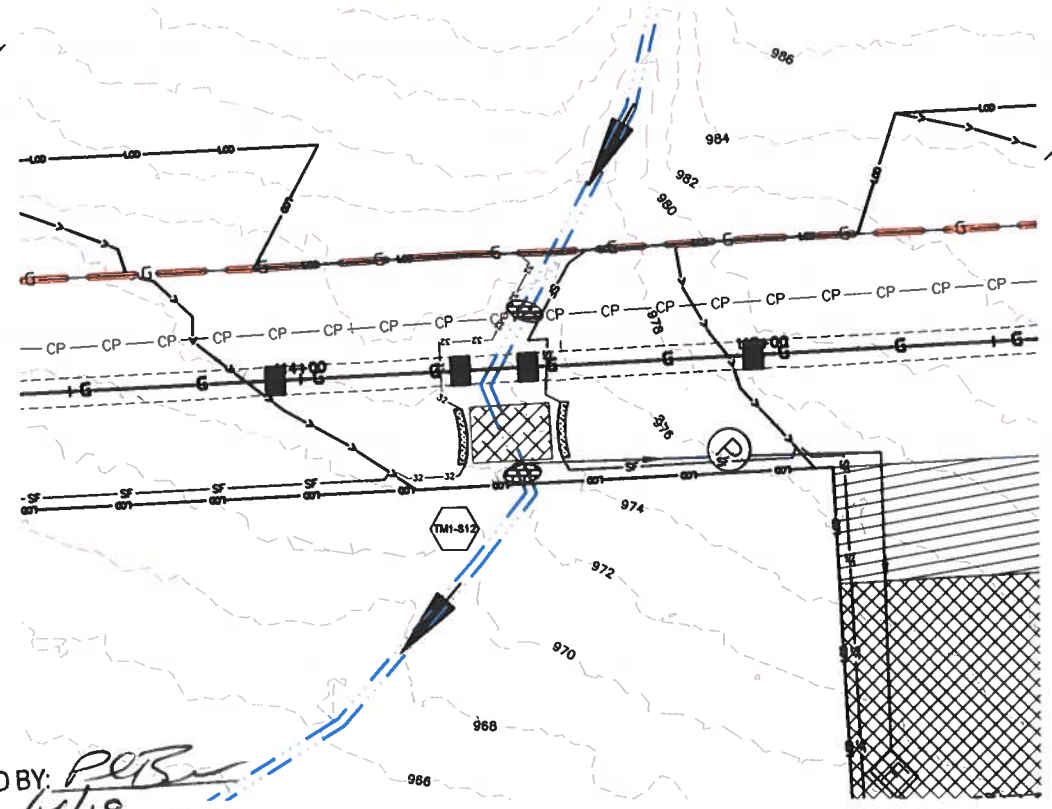
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-10

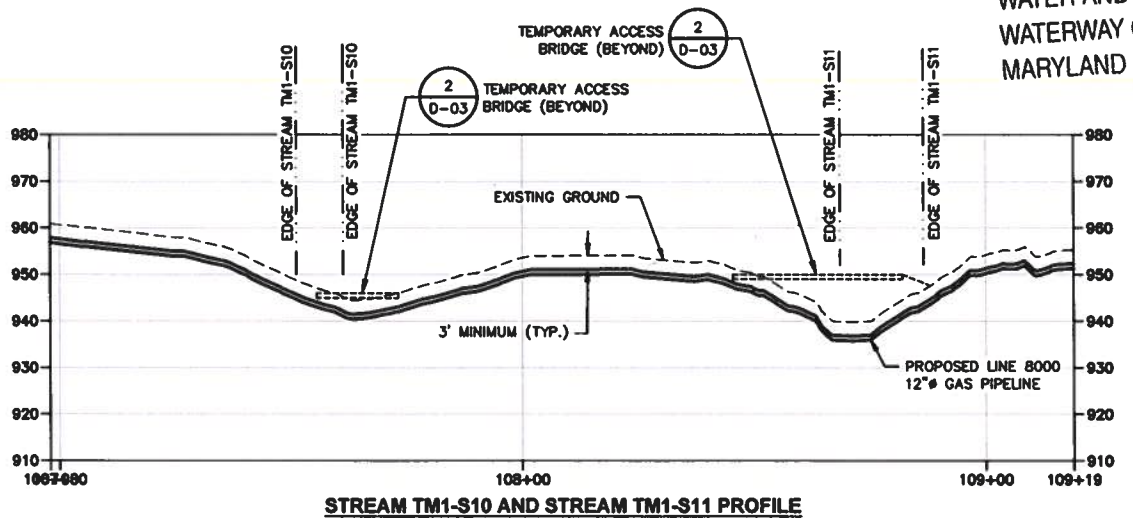


PLAN

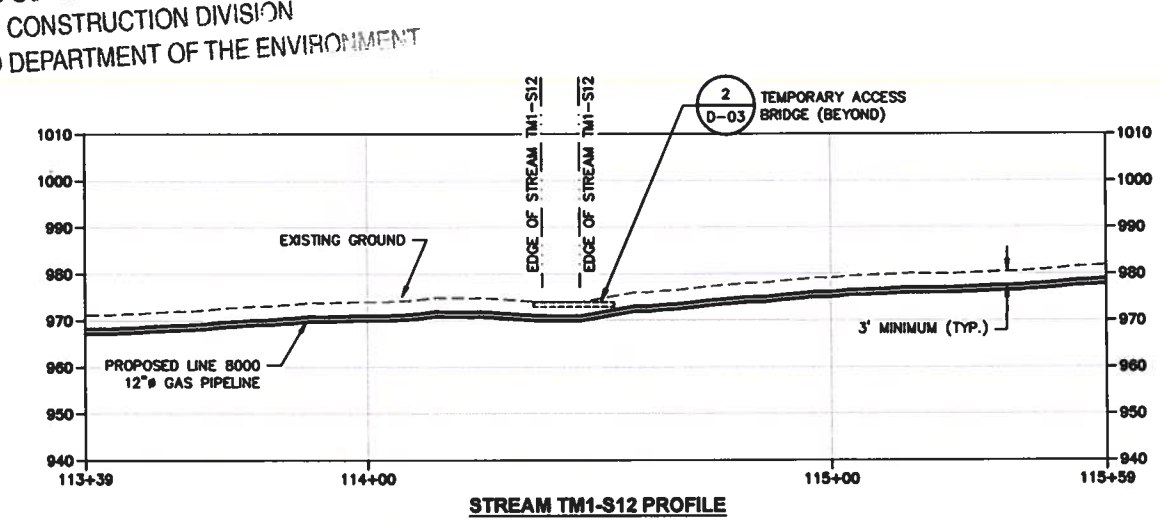


PLAN

PLANS APPROVED BY: PGB
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S10 AND STREAM TM1-S11 PROFILE



STREAM TM1-S12 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S10	R4	5	31	155	N/A	N/A	N/A	N/A	217	N/A	N/A	N/A
TM1-S11	R3	6	45	270	N/A	N/A	N/A	N/A	270	N/A	N/A	N/A
TM1-S12	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE — 3 D-01
- SSF — SUPER SILT FENCE — 4 D-01
- 24" COMPOST FILTER SOCK — 1 D-07
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION — 3 D-03
- TEMPORARY GABION — 3 D-06
- INTERCEPTOR DIVERSION — 1 D-02
- TRENCH PLUG — 2 D-02
- P — F — PUMP AND FILTER BAG — 3 D-02
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING — 2 D-03, 1 D-04
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) — 1 D-01, 2 D-01
- SOIL STABILIZATION MATTING — 1 D-03
- WEIGHTED SEDIMENT FILTER TUBE — 2 D-04
- BROAD-BASED DIP — 3 D-04
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSECT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

User:BJACKSON Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-11.DWG Scale:1:1 SavedDate:7/31/2018 Time:13:56 Plot Date: Tittle, Taylor H: 11/26/2018, 12:53 , Layout:22

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

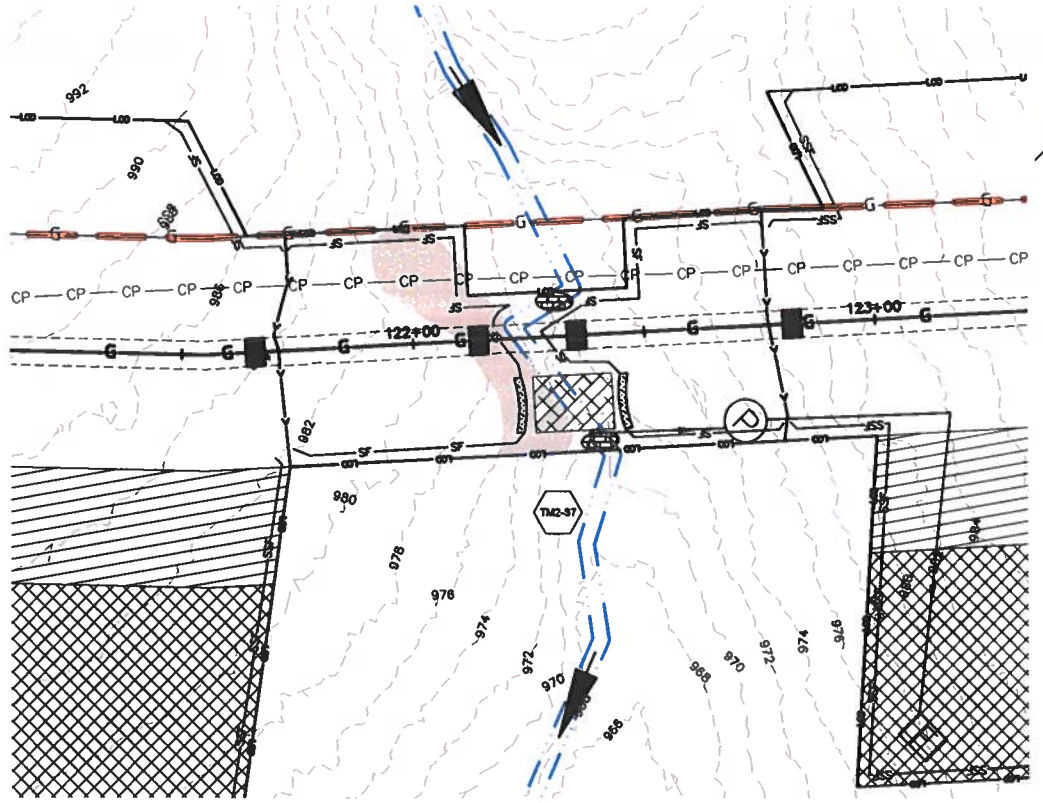
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S10, TM1-S11, AND TM1-S12 CROSSINGS

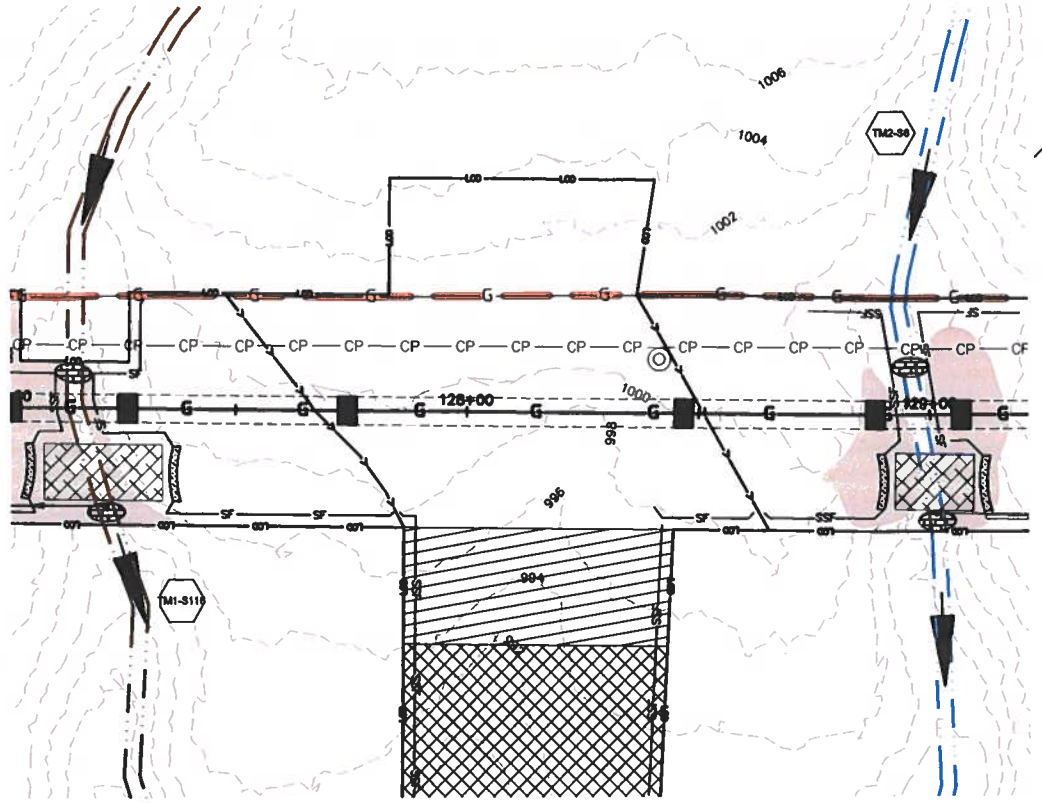
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

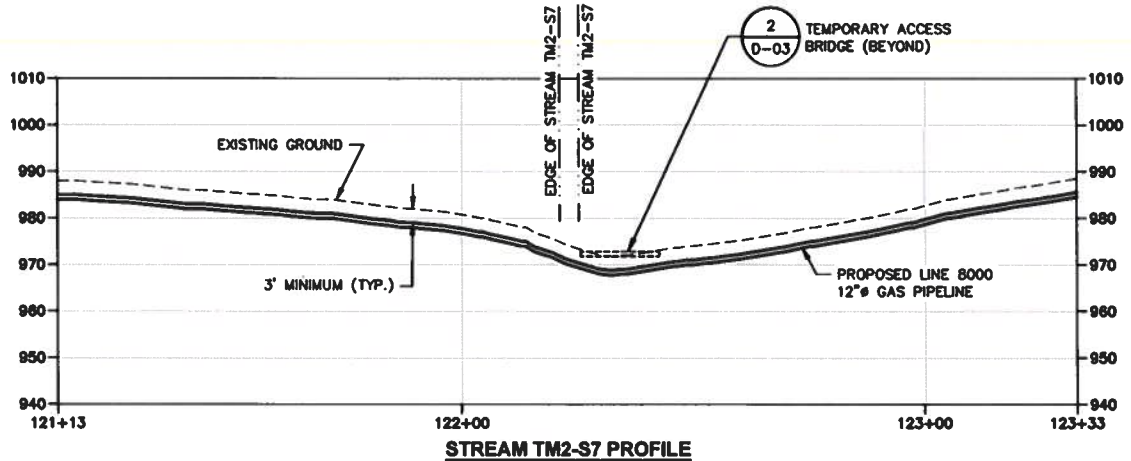
X-11



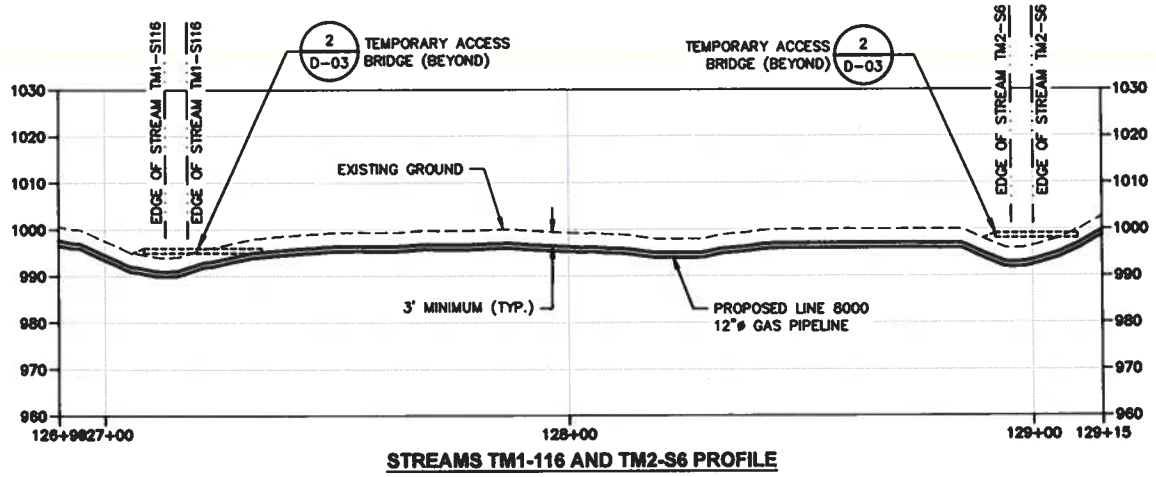
PLAN



PLAN



STREAM TM2-S7 PROFILE



STREAMS TM1-116 AND TM2-S6 PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF SILT FENCE (3 D-01)
- SSF SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary 25-ft Wetland Buffer Impact (sq ft)
TM2-S8	R4	4	42	168	N/A	N/A	N/A	N/A	400	N/A	N/A	N/A
TM2-S7	R4	3	43	129	N/A	N/A	N/A	N/A	240	N/A	N/A	N/A
TM1-S116	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: _____ DATE 7/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSECT
CGTL8000-PLT
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

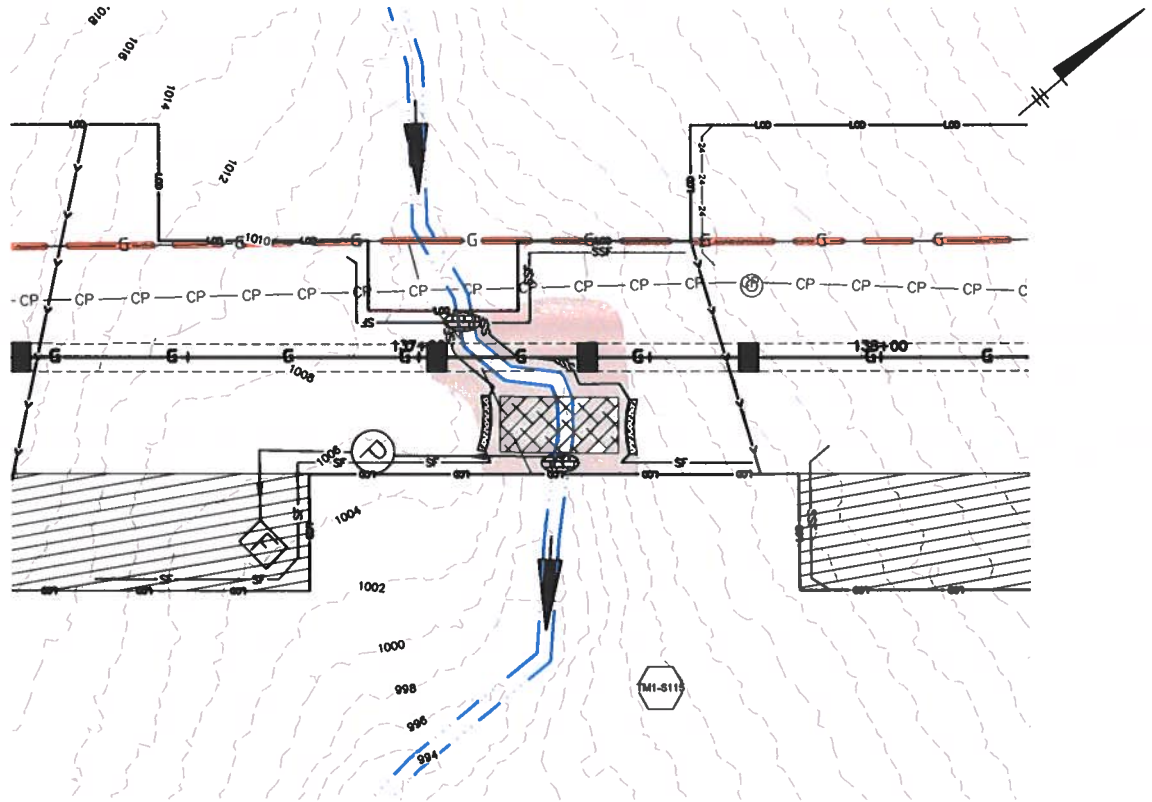
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S7, TM1-S116 AND TM2-S6 CROSSINGS

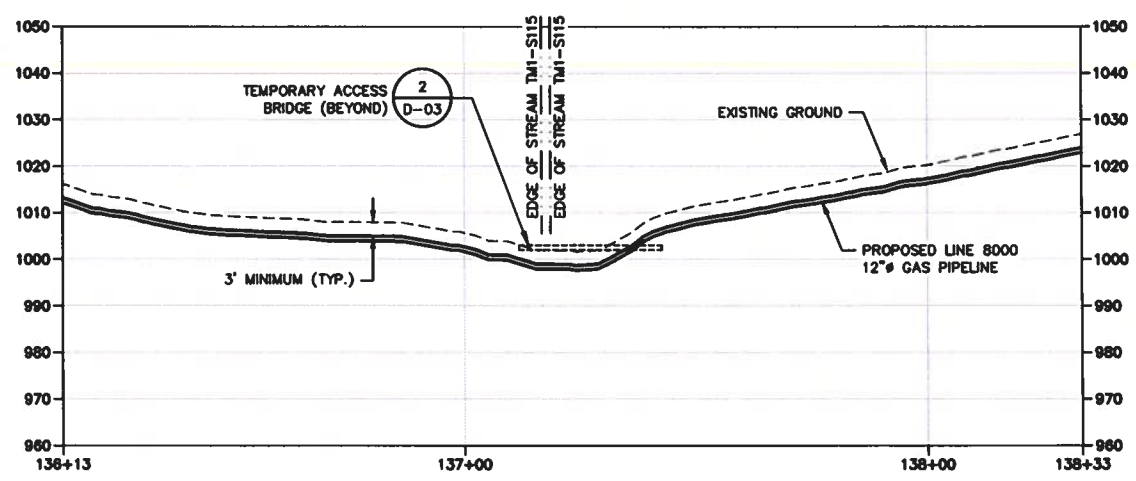
ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-12



PLAN



STREAM TM1-S115 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S115	R4	3	45	135	N/A	N/A	N/A	N/A	200	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24 — 24" COMPOST FILTER SOCK (1 D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-SEC
CGTL8000-XCT
HEXAGON KEYNOTES

User:BJACKSON Spec:AUS-NCSMOD File:G:\CADD\ACAD\PRO\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-12A.DWG Scale:1:1 SavedDate:7/31/2018 Time:14:08 Plot Date: Title, Taylor H. 11/26/2018 - 13:22 ; Layout:24

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

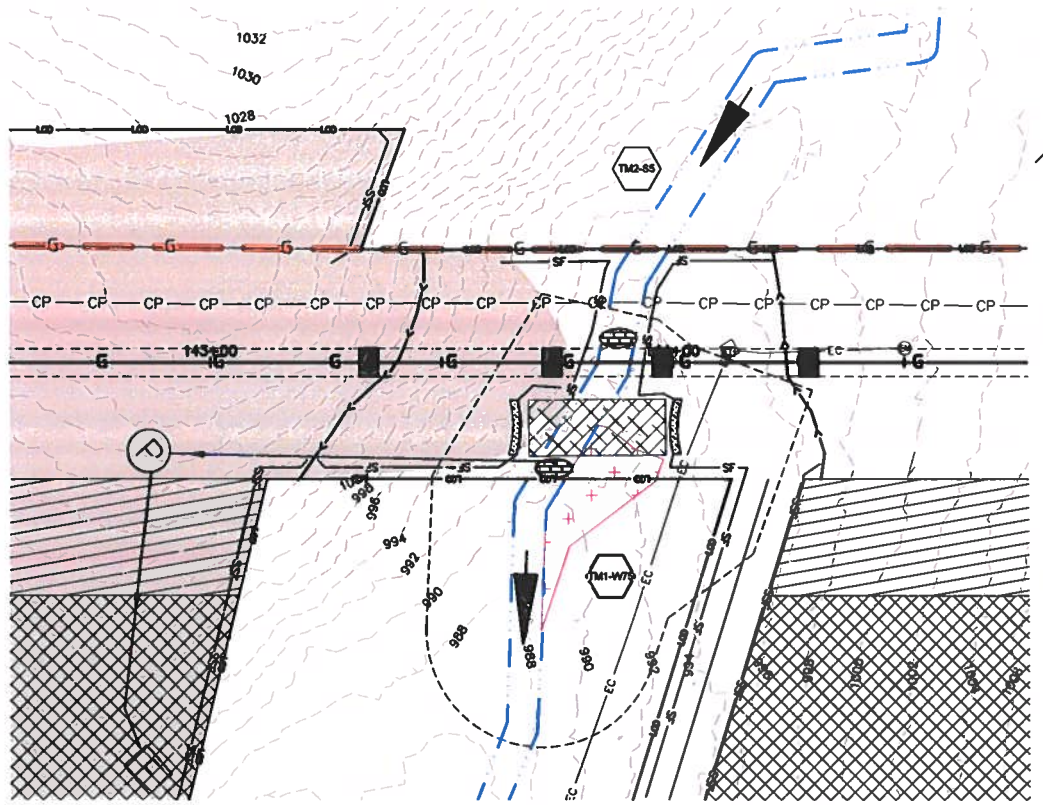
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

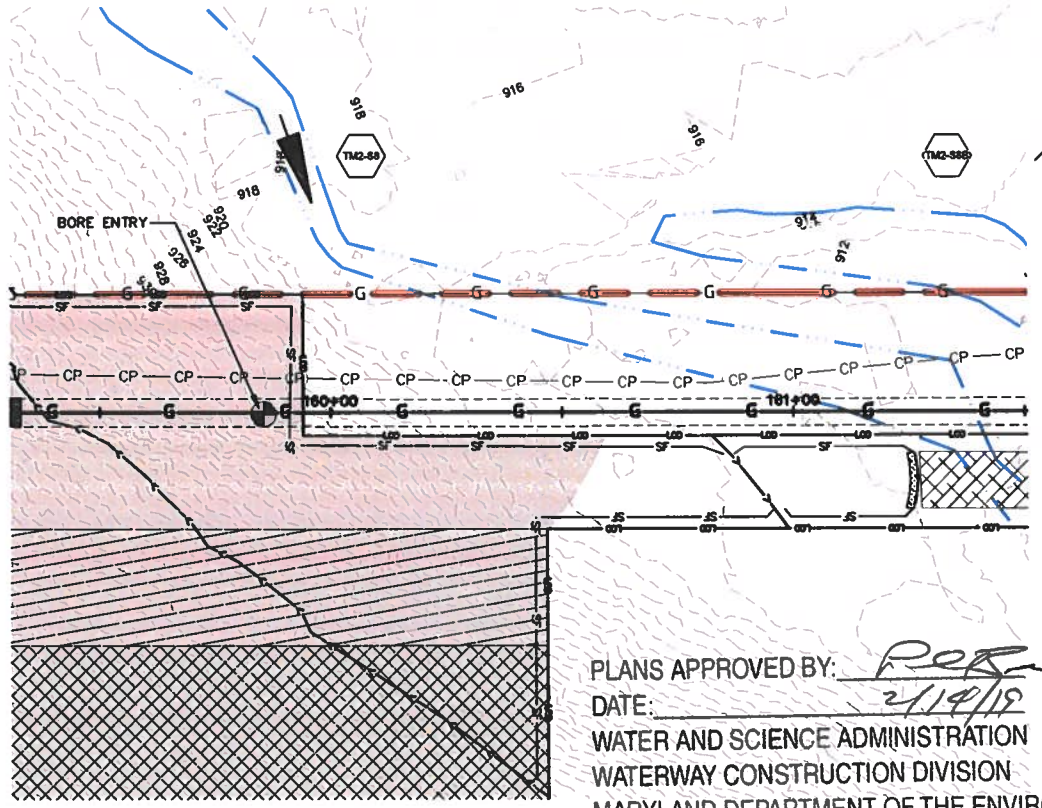
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S115 CROSSING

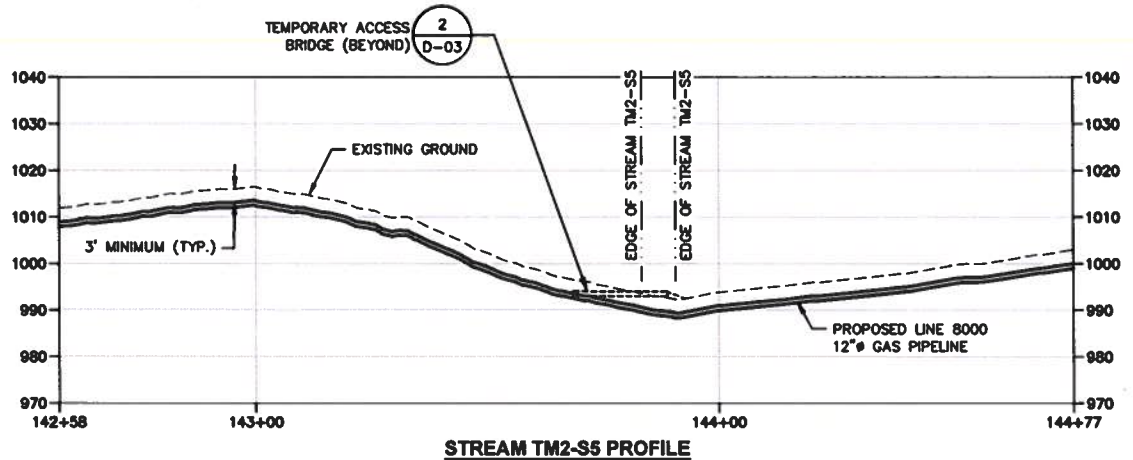
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-12A

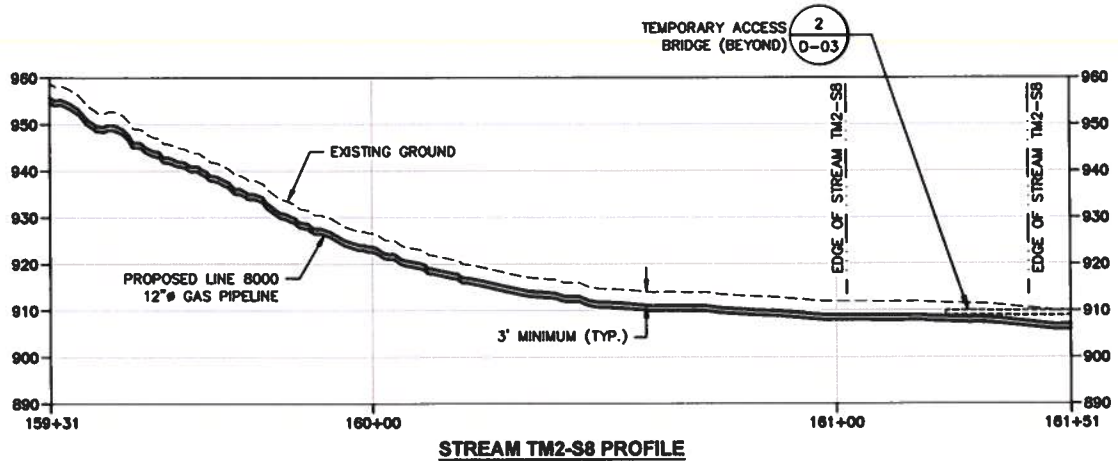




PLANS APPROVED BY: Pat
DATE: 2/14/18
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S5 PROFILE



STREAM TM2-S8 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM2-S5	R4	6	33	198	N/A	N/A	N/A	N/A	200	N/A	N/A	N/A
TM2-S8	R3	0	0	0	N/A	N/A	N/A	N/A	4,200	N/A	N/A	N/A
TM1-W75	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	145	N/A	2,048

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-GEN
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

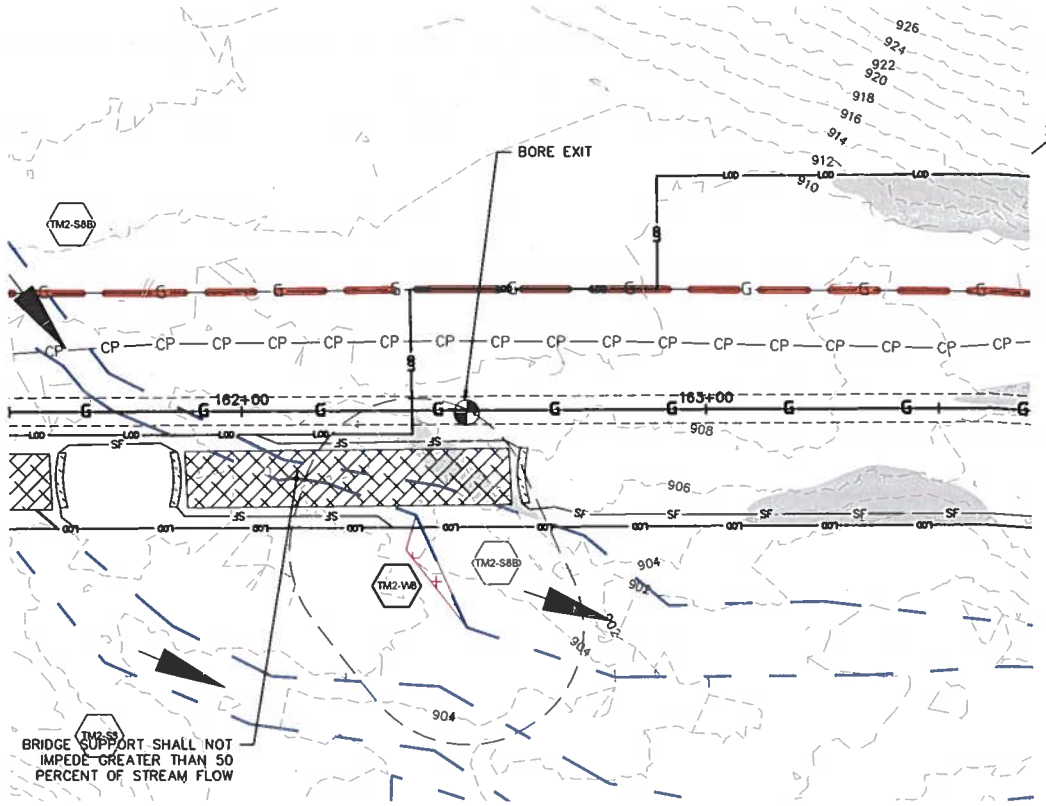
TM2-S5 AND TM2-S8 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

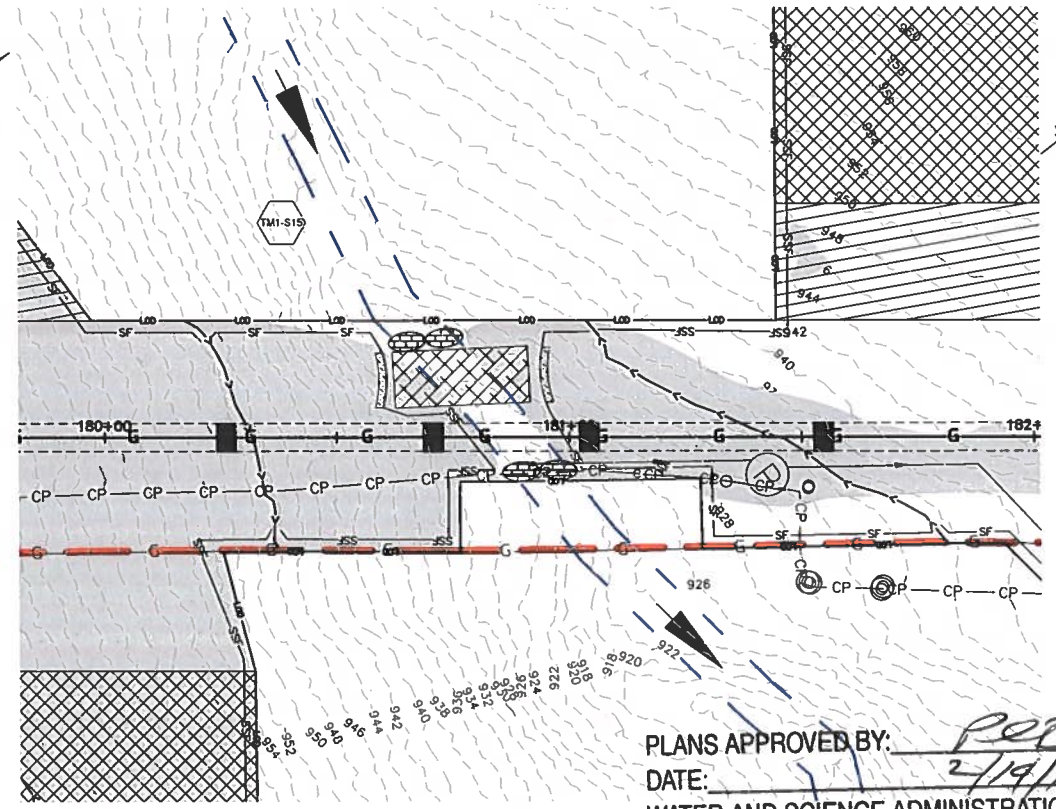
X-13

25 OF 94

User:TITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-13.DWG Scale:1:1 Saved/Date:11/26/2018 Time:13:38 Plot Date: Tittle, Taylor H; 11/27/2018; 09:42 ; Layout:25



PLAN

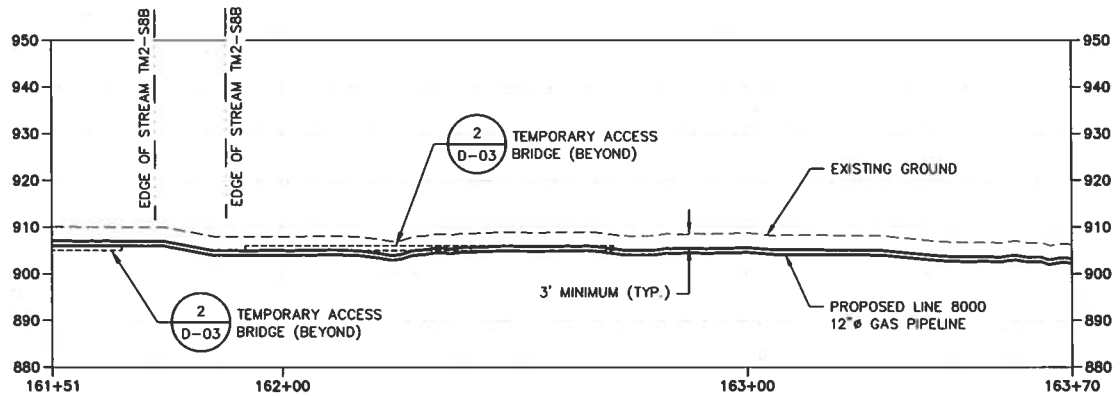


PLAN

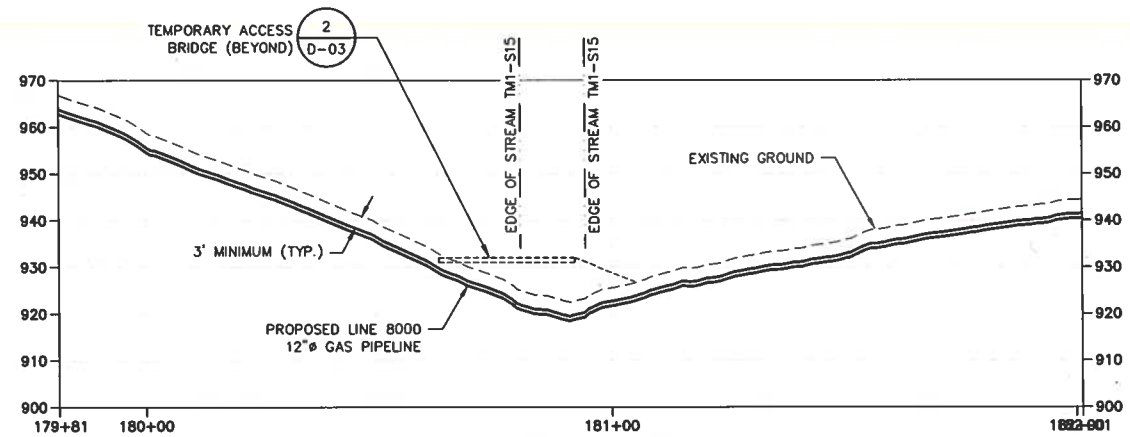
PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



STREAM TM2-S8B PROFILE



STREAM TM1-S15 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S8	R3	0	0	0	N/A	N/A	N/A	N/A	N/A	4,200	N/A	N/A	N/A
TM1-S15	R4	5	39	195	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-S8B	R3	10	4	40	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-W8	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	1,043

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-XCT
HEXAGON KEYNOTES_60 Scale
HEXAGON KEYNOTES_20 Scale

User:TITITLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000 0001 - LINE 8000\SHEETS\CROSSINGS\X-14.DWG Scale:1:1 SavedDate:11/27/2018 Time:09:30 Plot Date: Hunter, Owen, 12/11/2018, 15:52 ; Layout:26

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

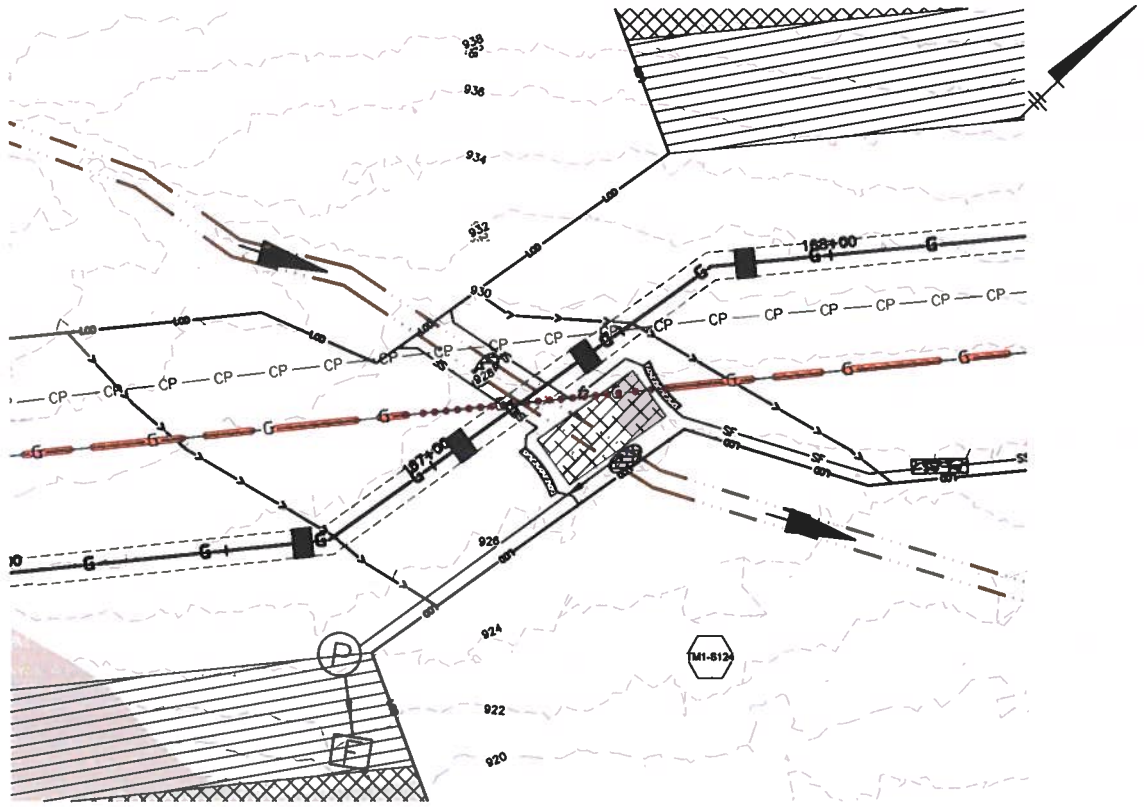
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S8, TM2-S8B, AND TM1-S15 CROSSINGS

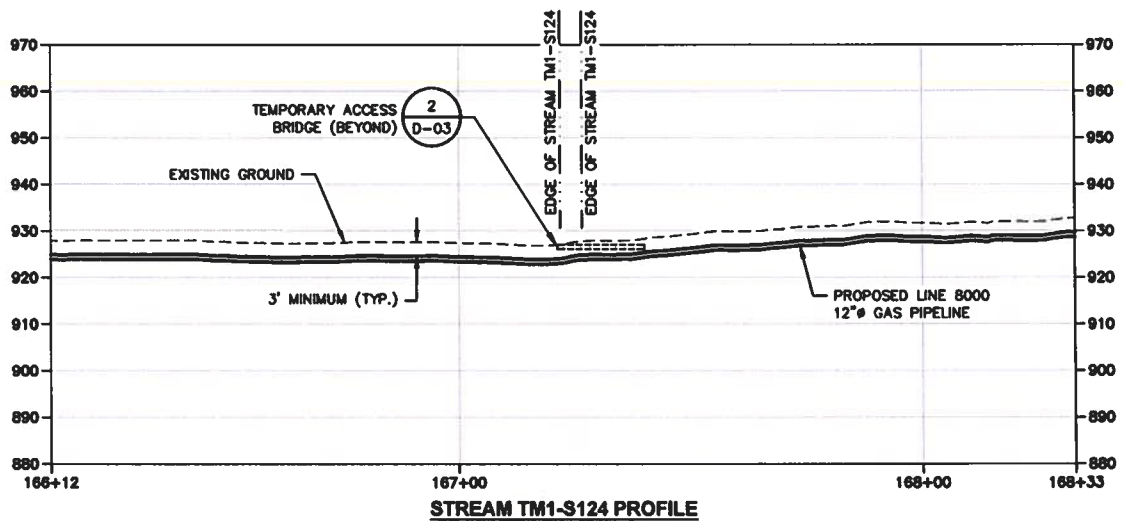
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-14



PLAN



STREAM TM1-S124 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 28-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S124	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-Jar22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PLAN
CGTL8000-XCT
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SE8	BJJ	MBH

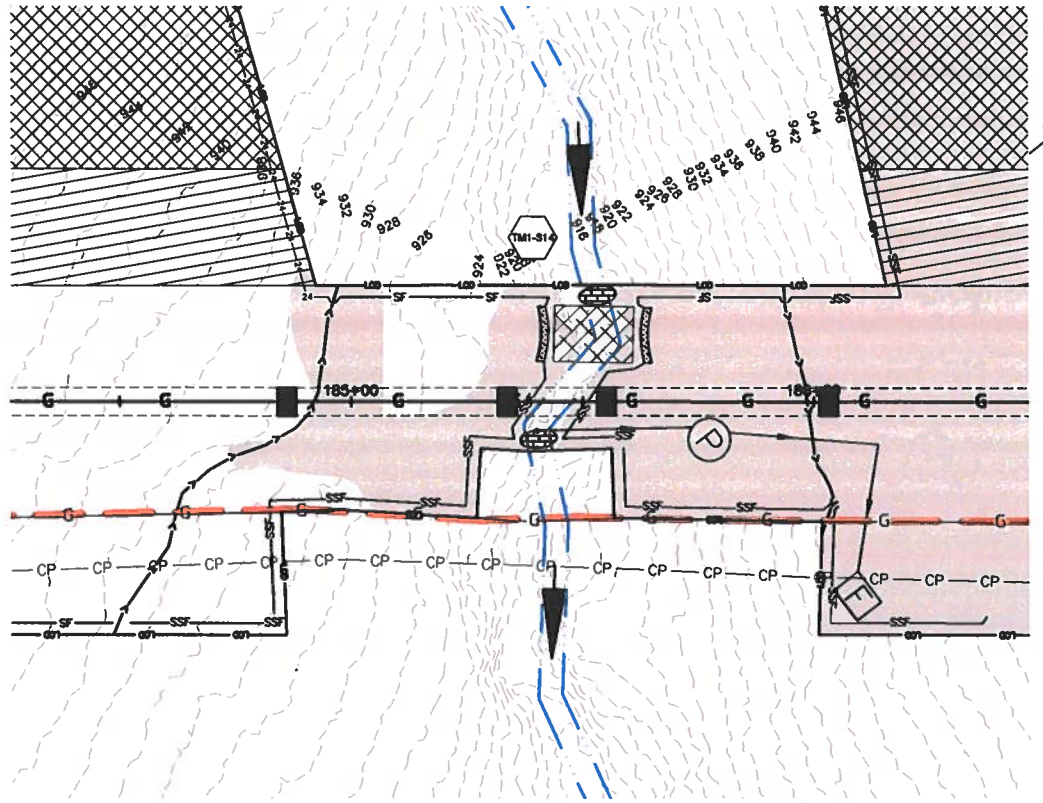
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

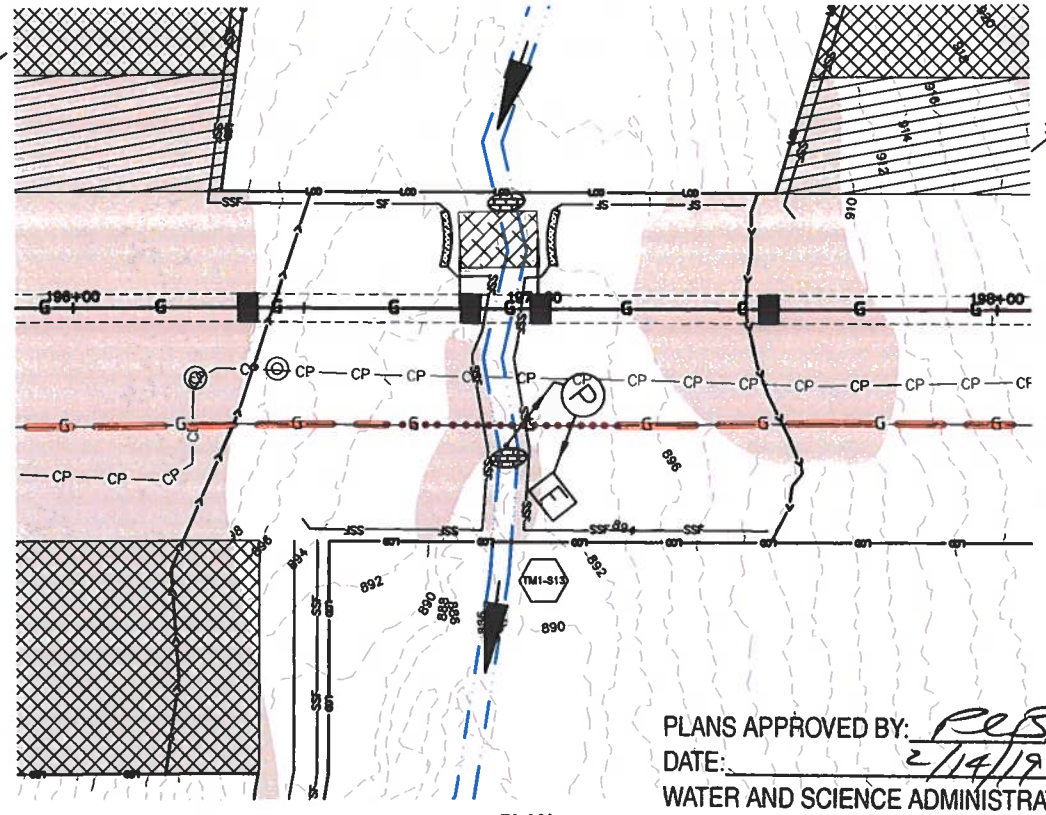
TM1-S124 AND TM1-S125 PROFILE

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-14A

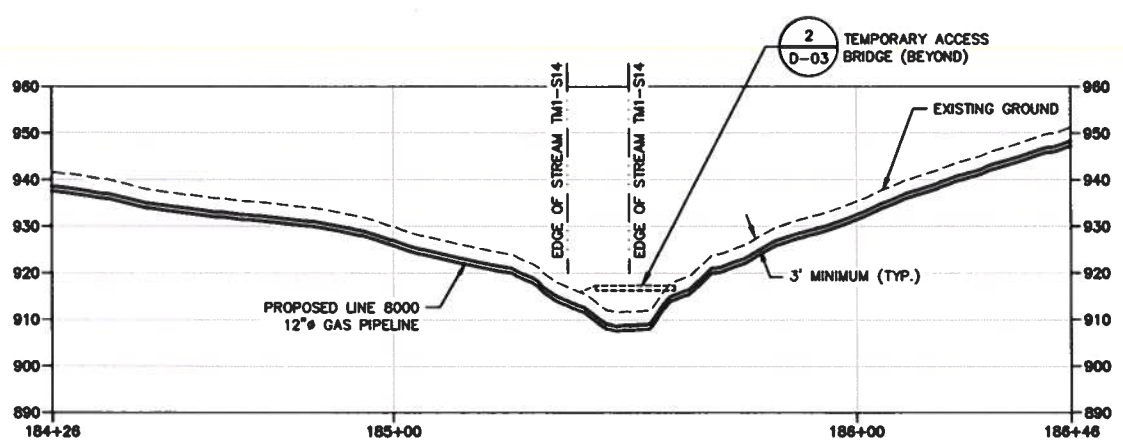


PLAN

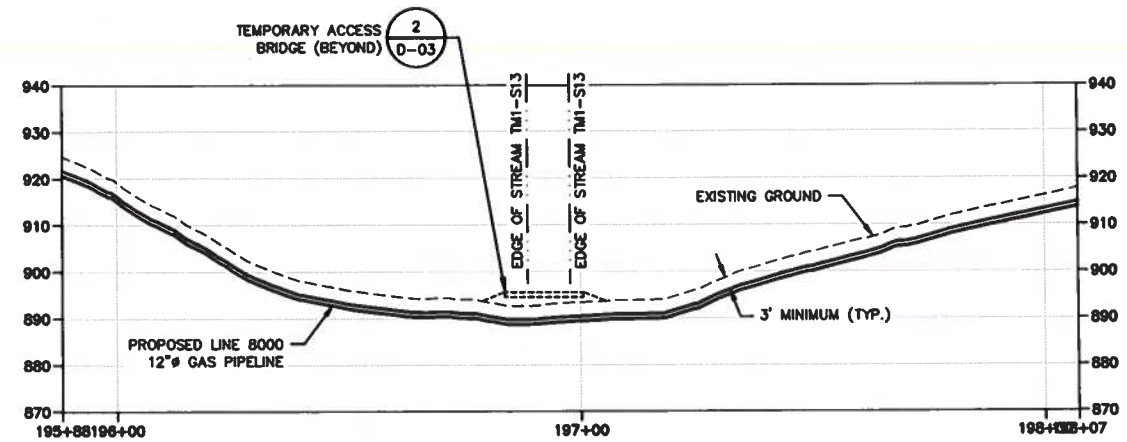


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S14 PROFILE



STREAM TM1-S13 PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S13	R4	4	57	228	N/A	N/A	N/A	N/A	1,330	N/A	N/A	N/A
TM1-S14	R3	5	37	185	N/A	N/A	N/A	N/A	210	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-ACT
CGTL8000-PI
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	SJJ	MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

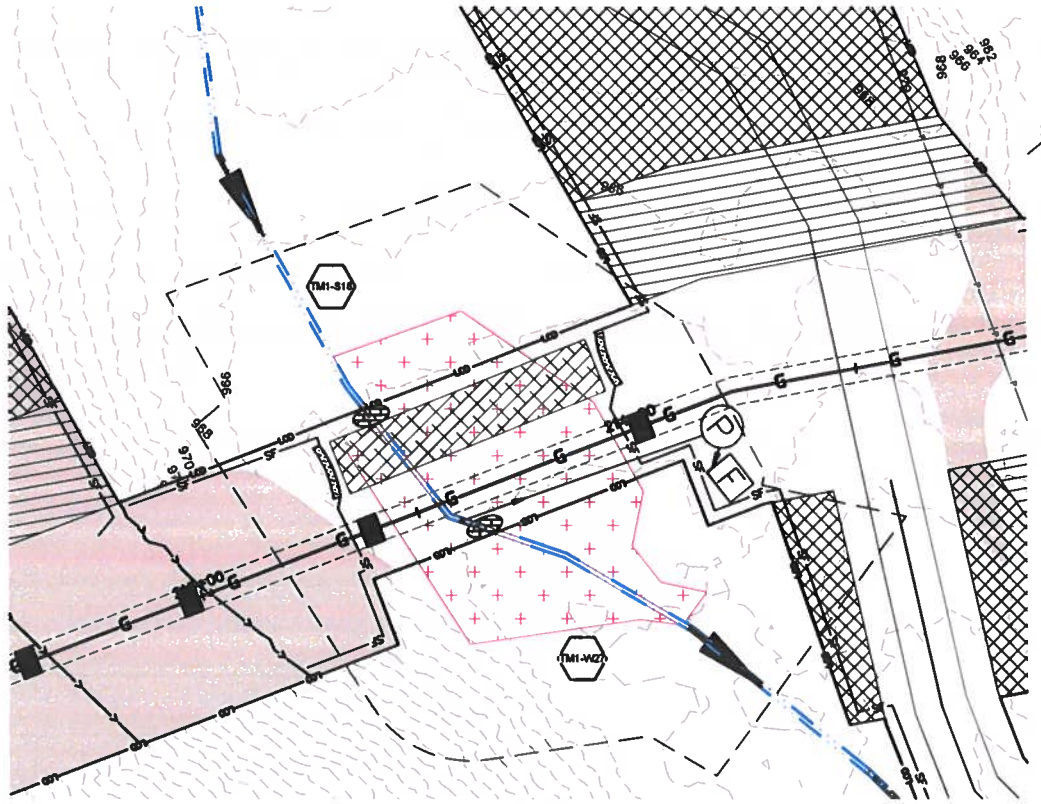
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S14 AND TM1-S13 CROSSINGS

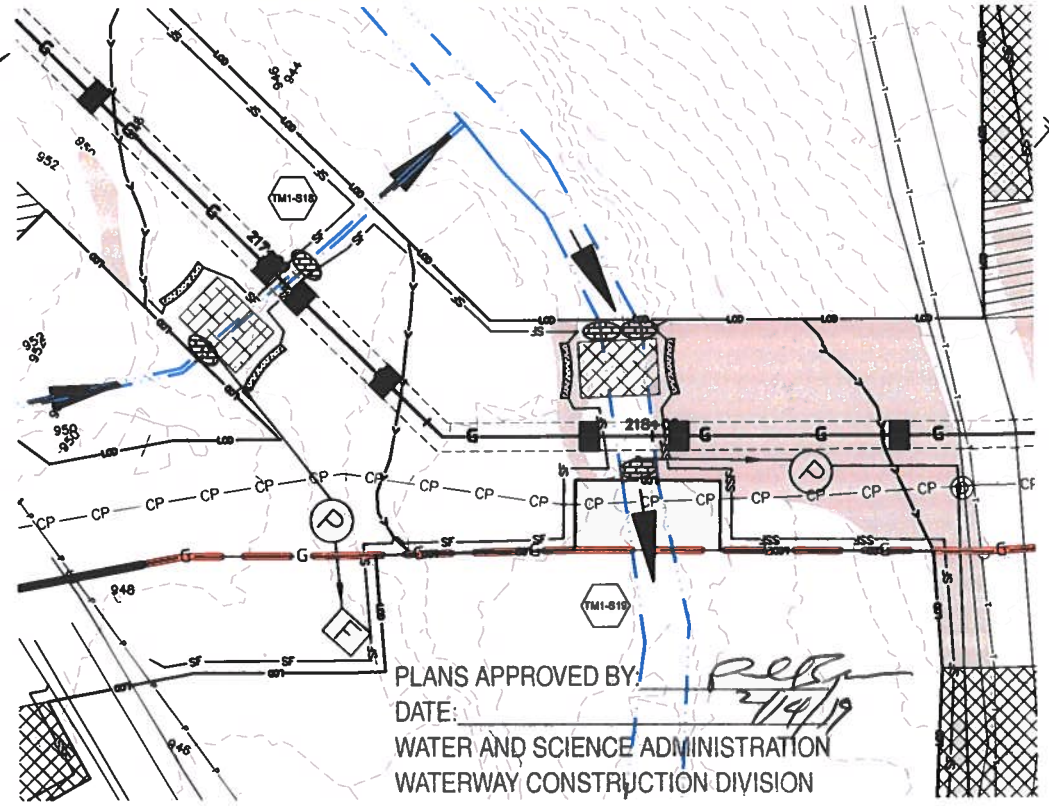
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-15

28 OF 94

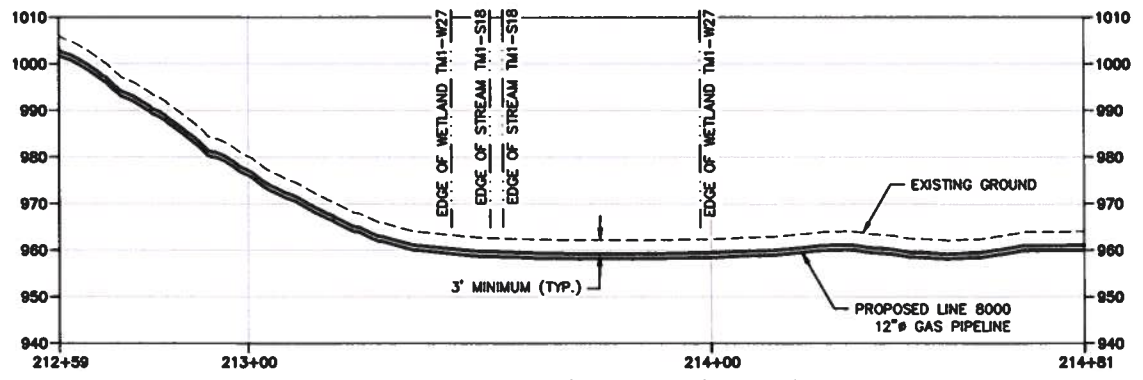


PLAN

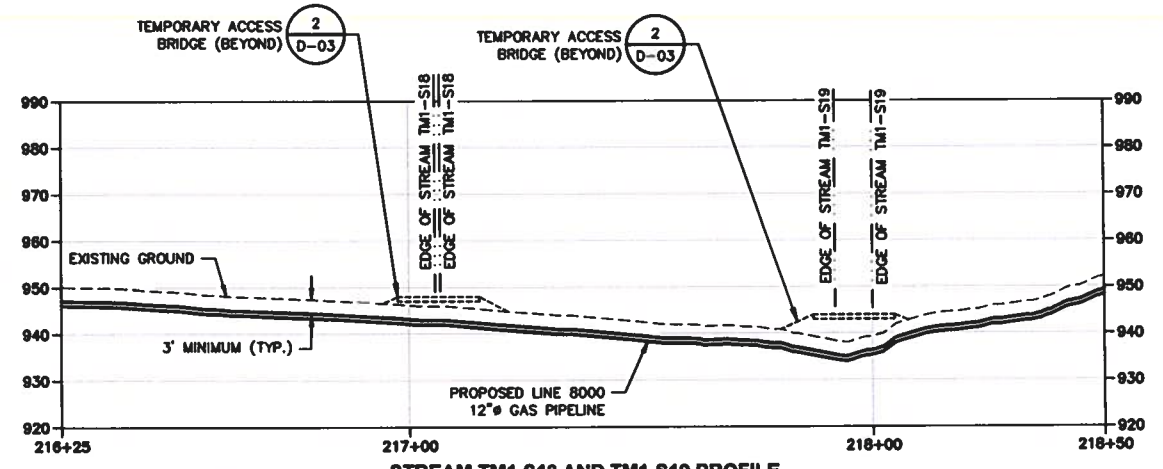


PLAN

PLANS APPROVED BY:
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



WETLAND TM1-W27 AND STREAM TM1-S18 PROFILE



STREAM TM1-S18 AND TM1-S19 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S18 (eastern crossing)	R4	2	32	64	N/A	N/A	N/A	N/A	198	N/A	N/A	N/A
TM1-S18 (western crossing)	R4	2	37	74	N/A	N/A	N/A	N/A	405	N/A	N/A	N/A
TM1-S19	R3	12	30	360	N/A	N/A	N/A	N/A	1,003	N/A	N/A	N/A
TM1-W27	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,845	N/A	2,451

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSECT
CGTL8000-PLT
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS		
Professional Engineer's No.	MD 52652		
State	Date Signed	Project Mgr.	
MD	11/28/2018	JD	
Designed by	Drawn by	Checked by	
SES	BJJ	MBH	

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

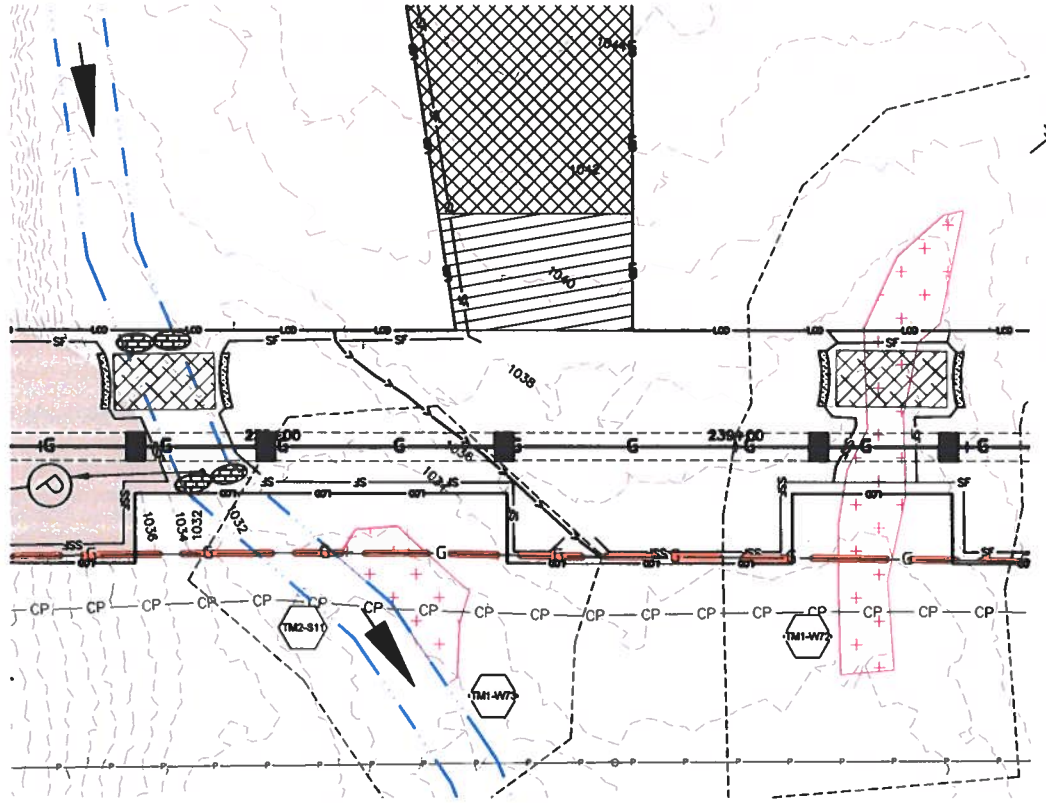
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-W27, TM1-S18, AND TM1-S19 CROSSINGS

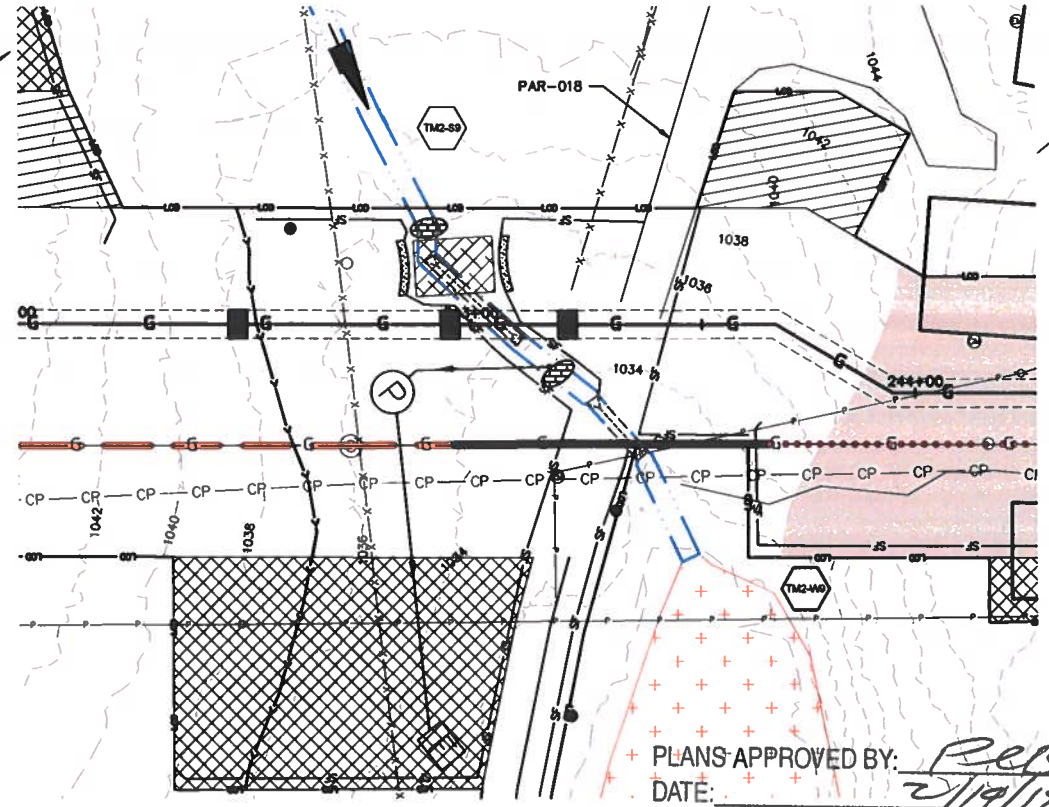
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-16

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-16.DWG Scale:1:1 Saved Date:9/2/2018 Time:17:47 Plot Date: Title, Taylor H: 11/28/2018, 14:54 : Layout29

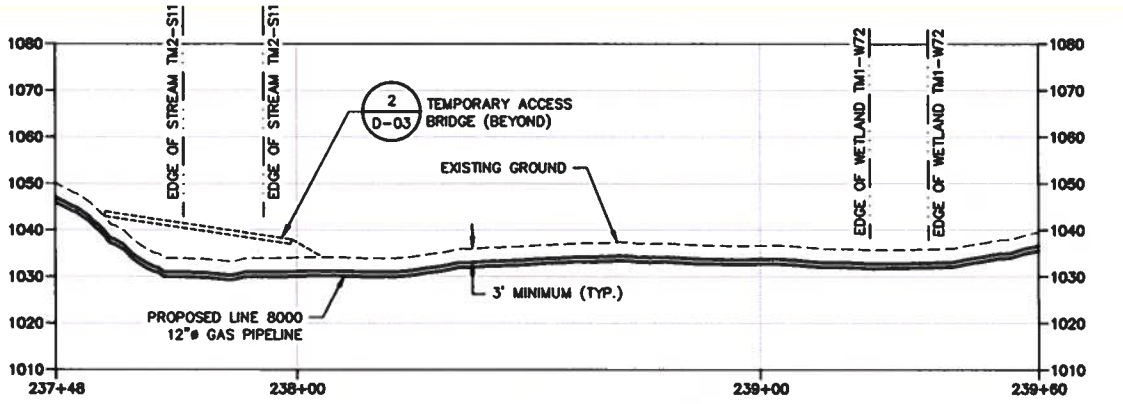


PLAN

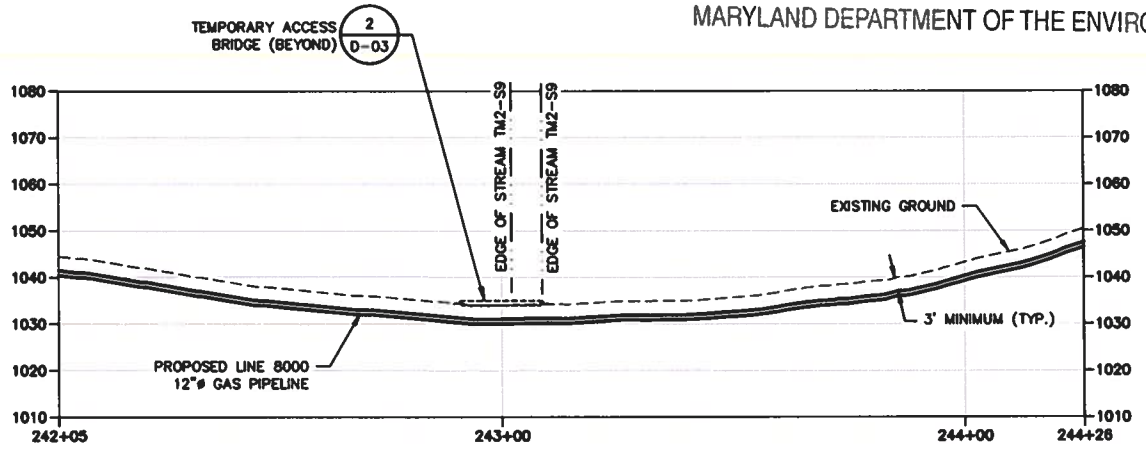


PLAN

PLANS APPROVED BY: P.E.S.
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S11 AND WETLAND TM1-W72 PROFILE



STREAM TM2-S9 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM2-S11	R3	11	32	352	N/A	N/A	N/A	N/A	608	N/A	N/A	N/A
TM2-S9	R4	4	44	176	N/A	N/A	N/A	N/A	560	N/A	N/A	N/A
TM1-W72	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	366	N/A	2,263
TM1-W73	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	989

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF SILT FENCE — 3 D-01
- SSF SUPER SILT FENCE — 4 D-01
- 24" COMPOST FILTER SOCK — 1 D-07
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION — 3 D-03
- TEMPORARY GABION — 3 D-06
- INTERCEPTOR DIVERSION — 1 D-02
- TRENCH PLUG — 2 D-02
- P F PUMP AND FILTER BAG — 3 D-02
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING — 2 D-03, 1 D-04
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) — 1 D-01, 2 D-01
- SOIL STABILIZATION MATTING — 1 D-03
- WEIGHTED SEDIMENT FILTER TUBE — 2 D-04
- BROAD-BASED DIP — 3 D-04
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-SST
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

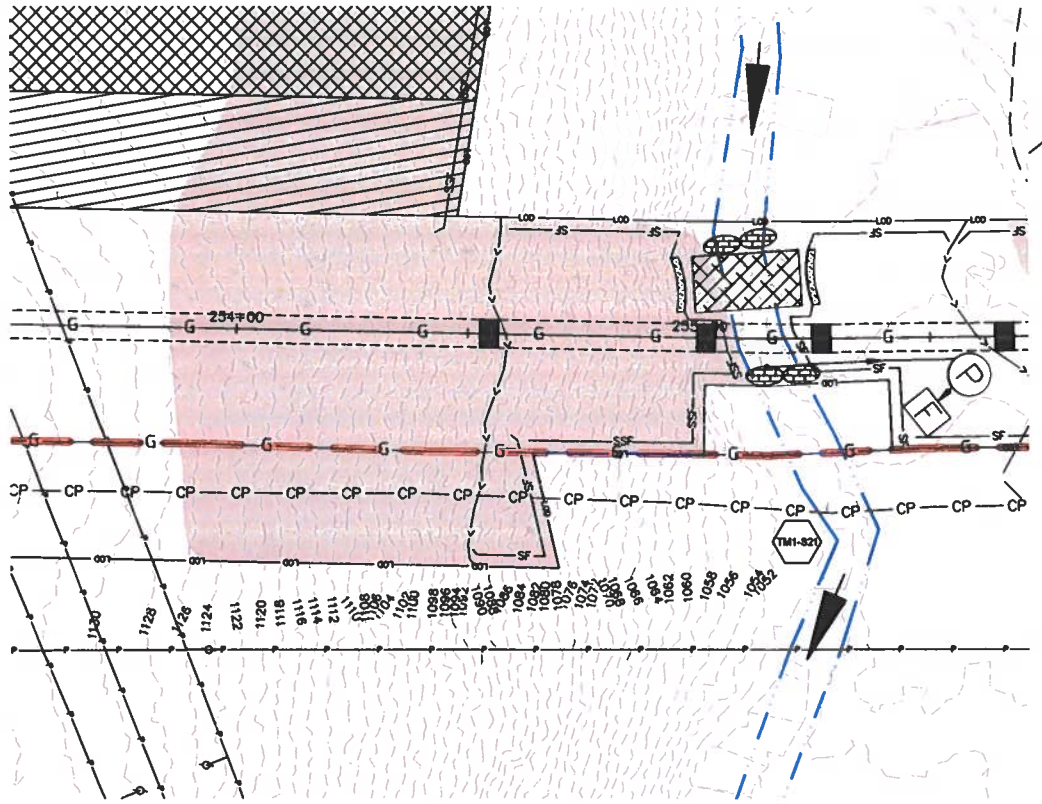
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S11, TM1-W72 AND TM2-S9 CROSSINGS

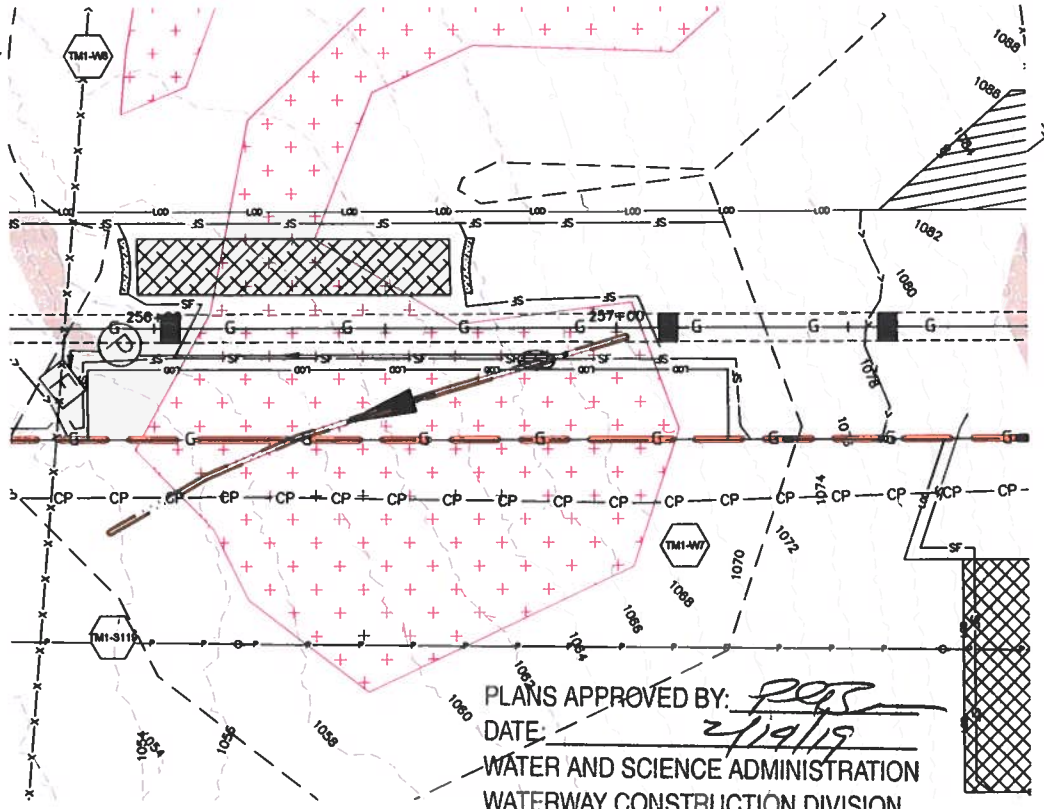
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-17

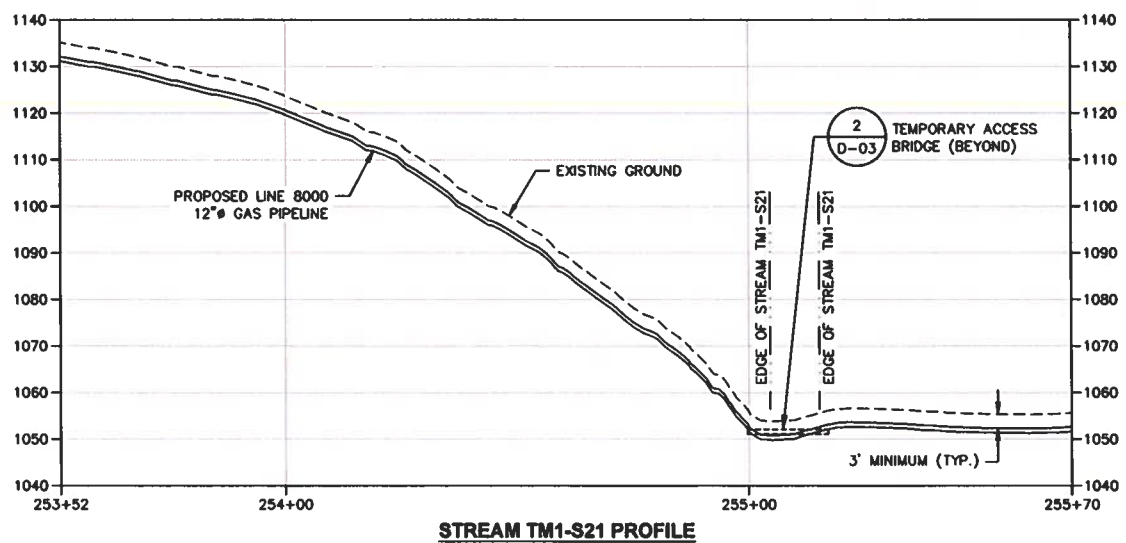


PLAN

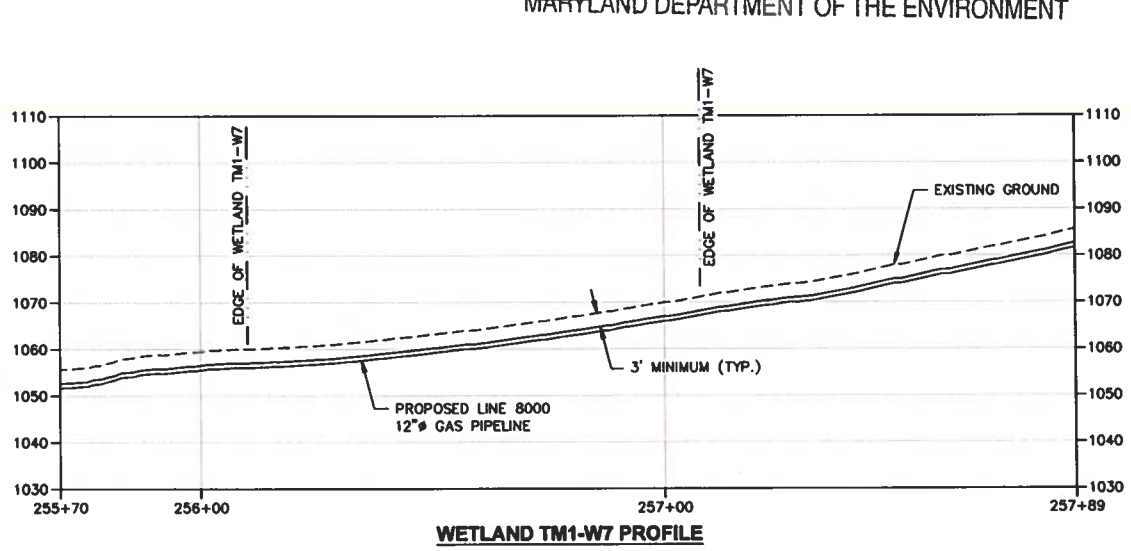


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S21 PROFILE



WETLAND TM1-W7 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S21	R3	6	32	266	N/A	N/A	N/A	N/A	665	N/A	N/A	N/A
TM1-W7	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,812	N/A	3,432
TM1-S119	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-W8	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	78

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEY/NOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS	
Professional Engineer's No.	MD 52852	
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS U.S., INC.

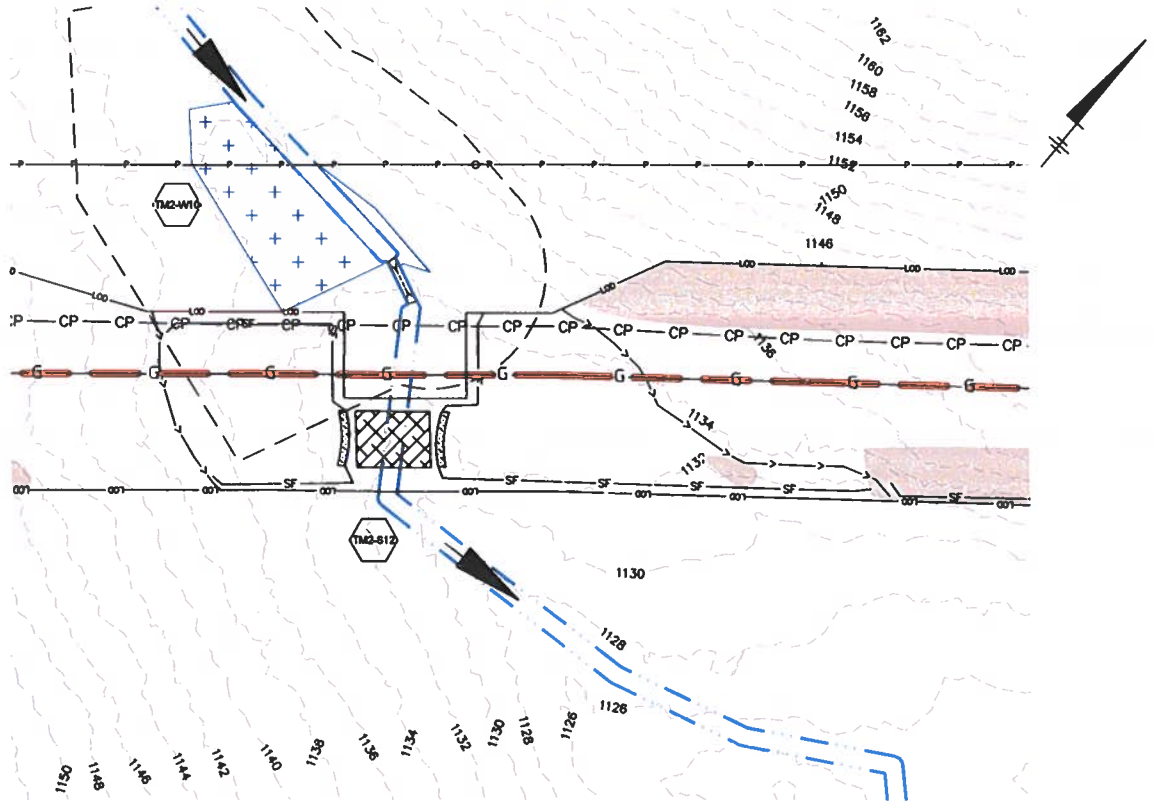
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S21 AND TM1-W7 CROSSINGS

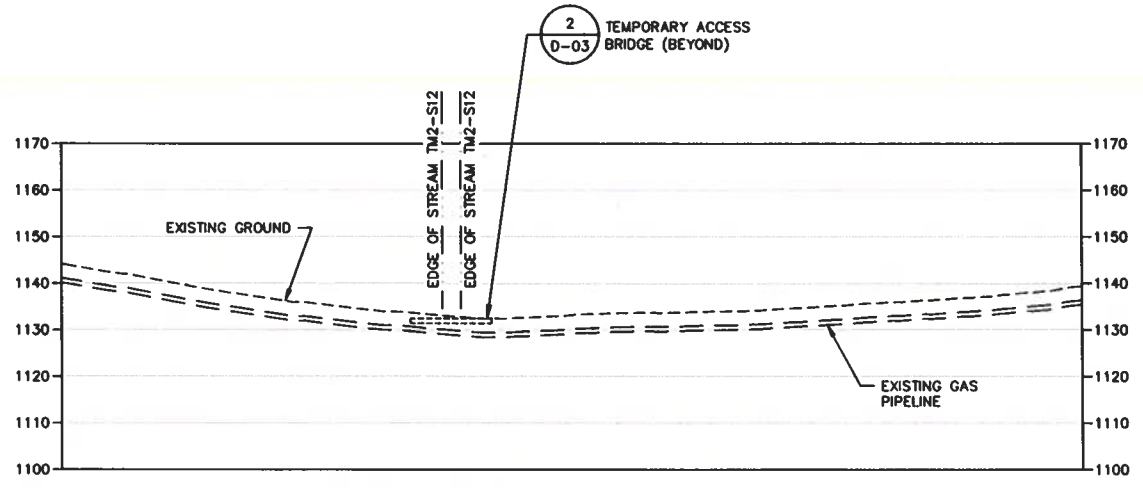
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-18



PLAN



EXISTING CROSSING STREAM TM2-S12 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S12 (existing ROW for access)	R3	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-W10	PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	990

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

IMAGES:

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

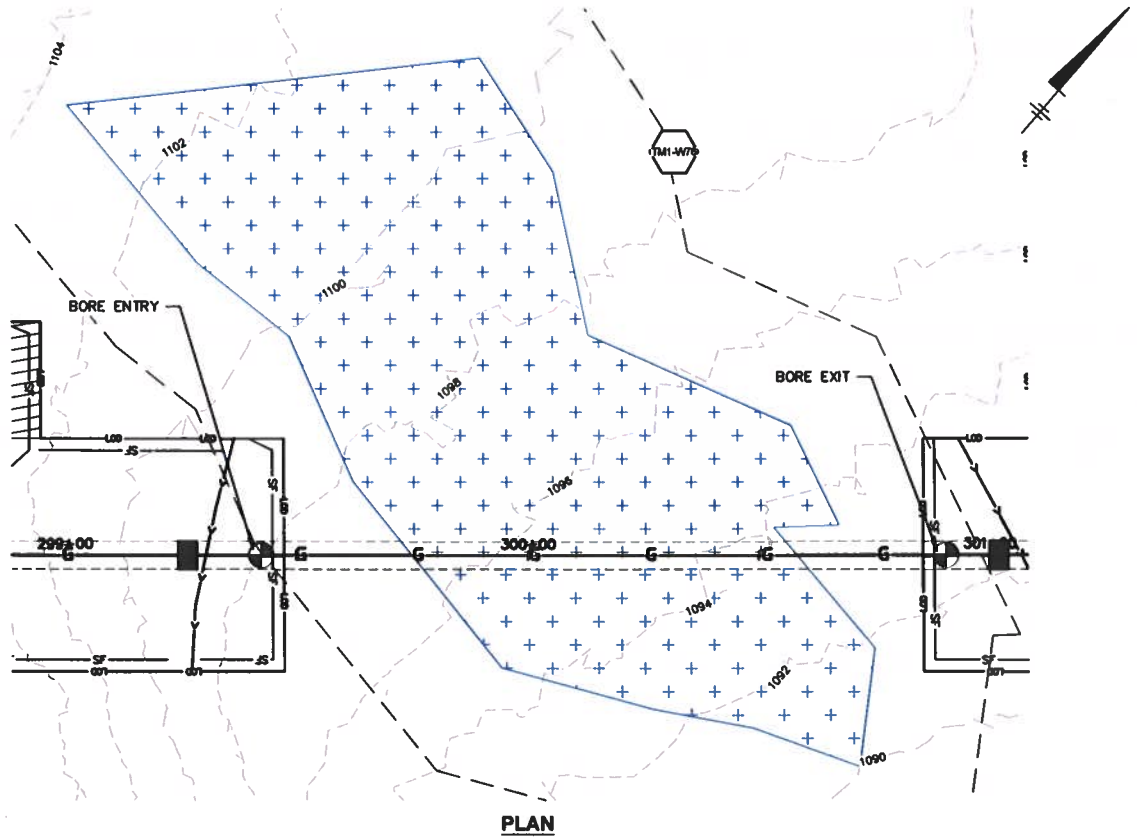
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSING TM2-S12

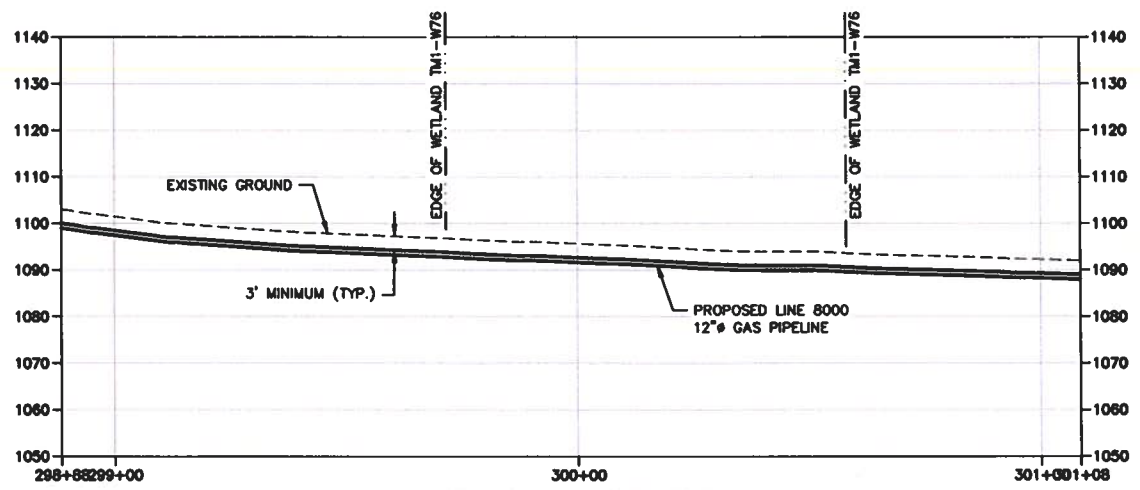
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-19

32 OF 94



PLAN



WETLAND TM1-W76 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W76	PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	708

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-SSC
HEXAGON KEYNOTES
CGTL8000-XCT

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

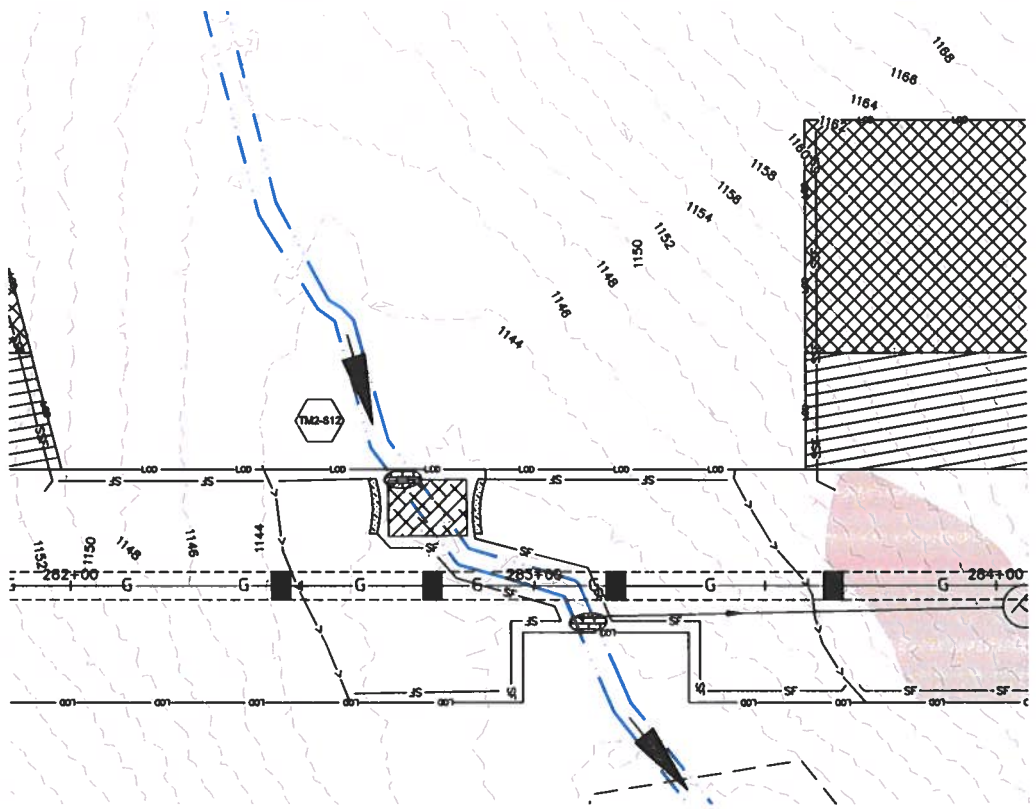
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-W76 CROSSING

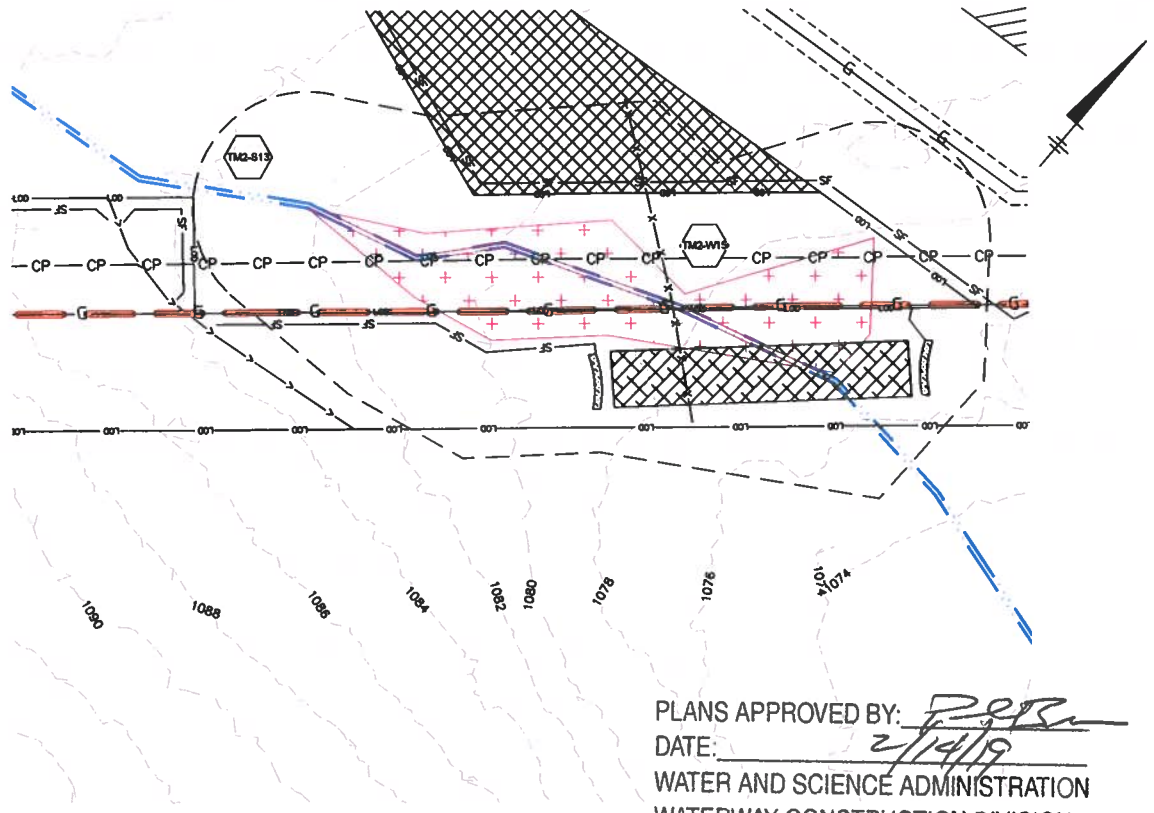
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-19A



PLAN

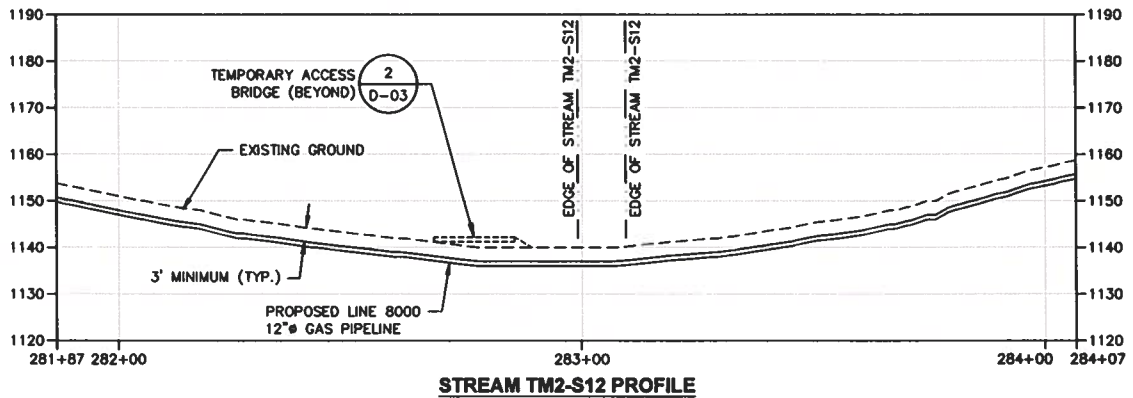


PLAN

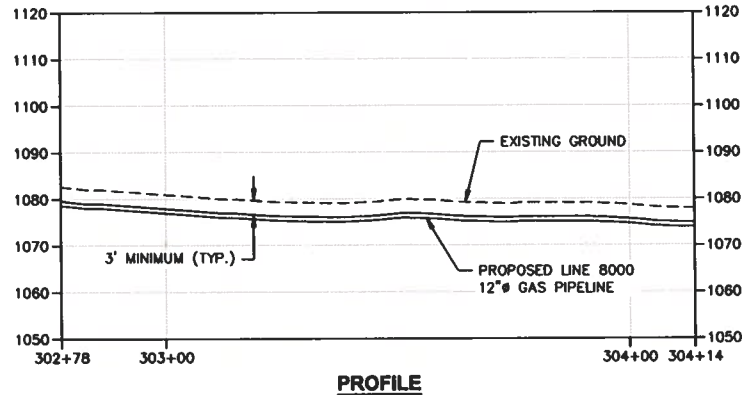
PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



STREAM TM2-S12 PROFILE



PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S12 (new pipe installation)	R3	4	54	216	N/A	N/A	N/A	N/A	1,026	N/A	N/A	N/A
TM2-S13	R4	0	0	0	N/A	N/A	N/A	N/A	385	N/A	N/A	N/A
TM2-W15	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	730	N/A	4,889

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-24x22
CGTL8000-LEGEND
CGTL8000-SEC
CGTL8000-XSECT
CGTL8000-PL
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.
USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

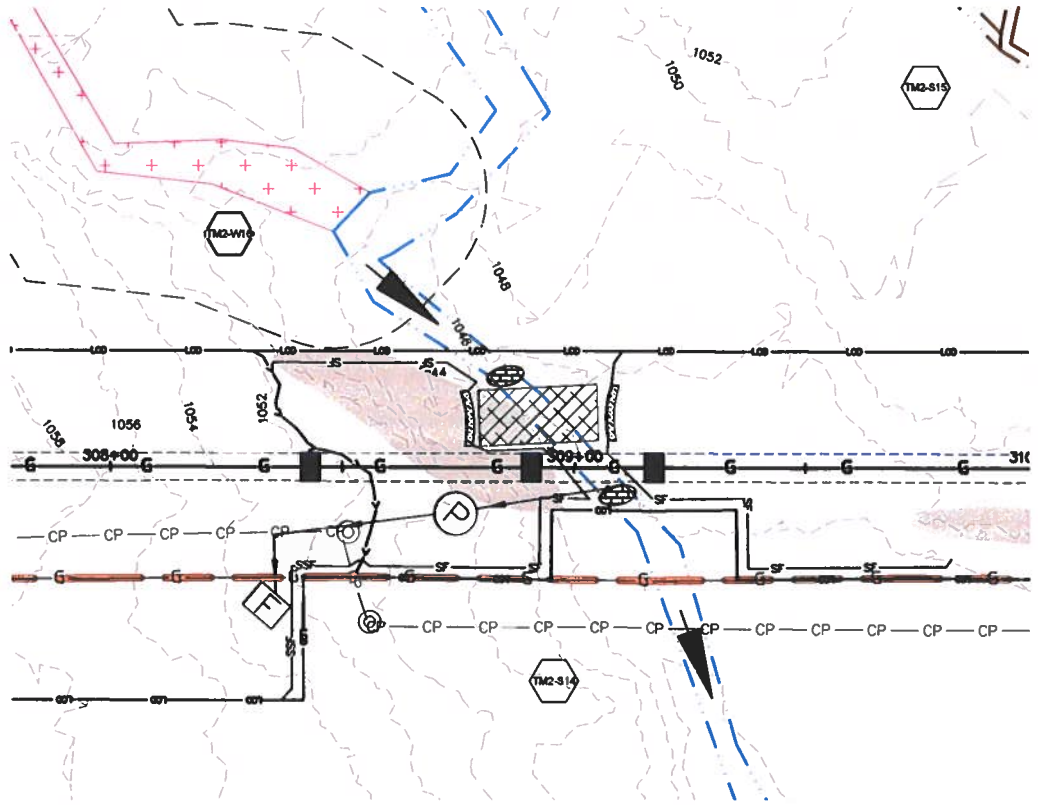
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S12, TM2-S13, AND TM2-W15 CROSSINGS

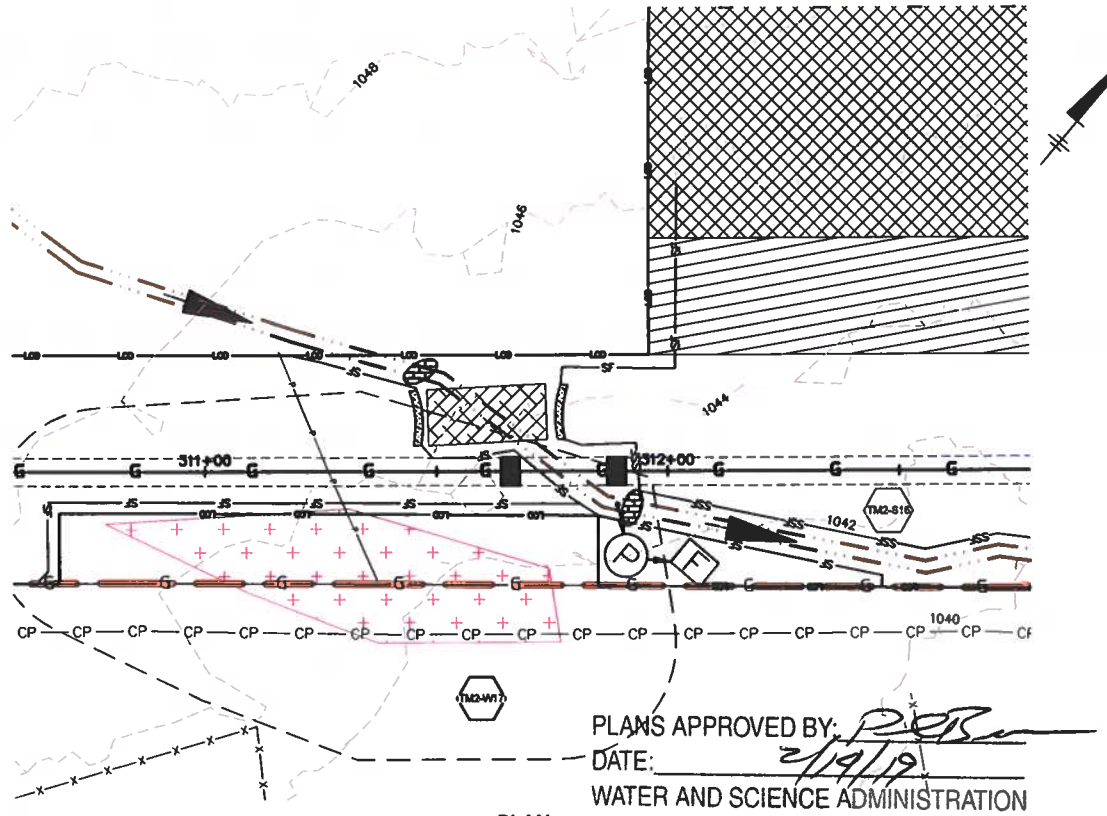
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-20

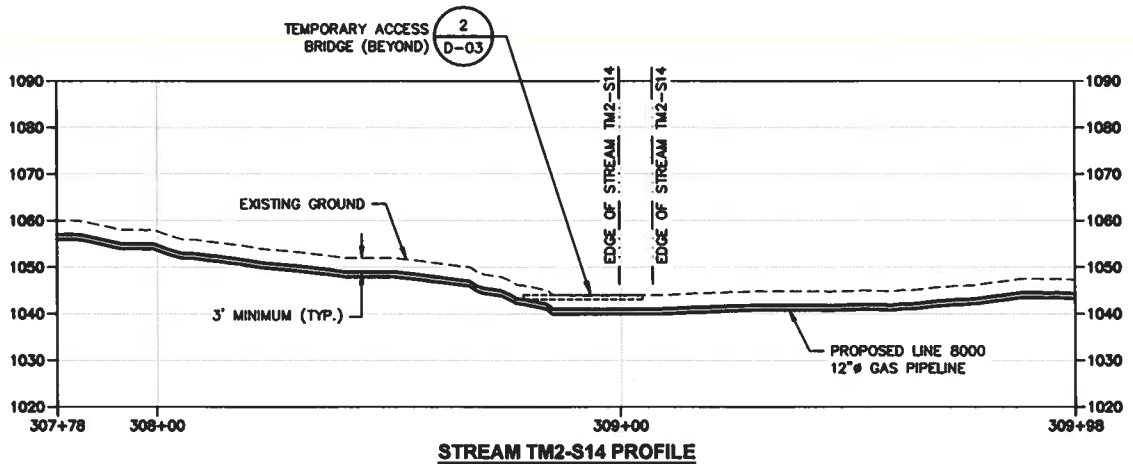


PLAN

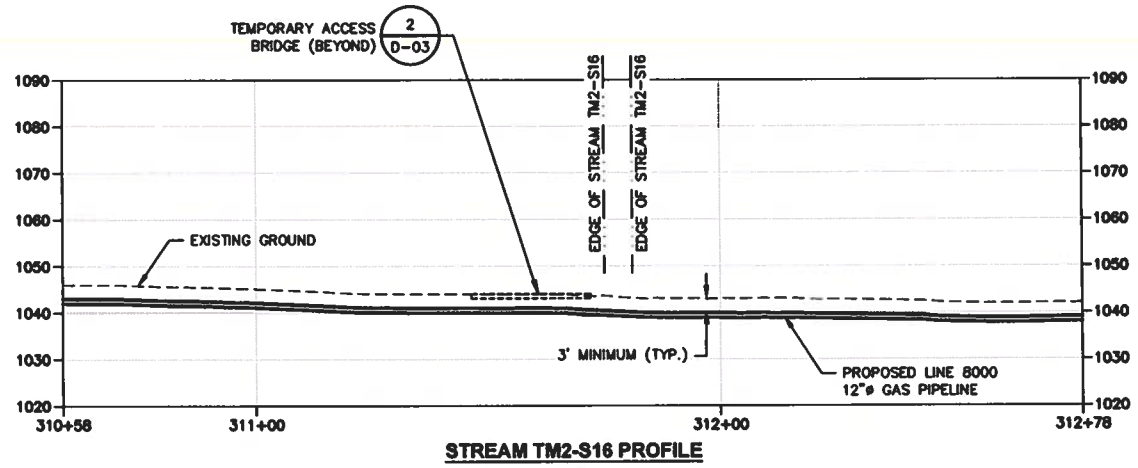


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S14 PROFILE



STREAM TM2-S16 PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S14	R3	10	35	350	N/A	N/A	N/A	N/A	850	N/A	N/A	N/A
TM2-W17	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	N/A	3,239
TM2-S16	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-SCH
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC.
Design & Consultancy for natural and built assets

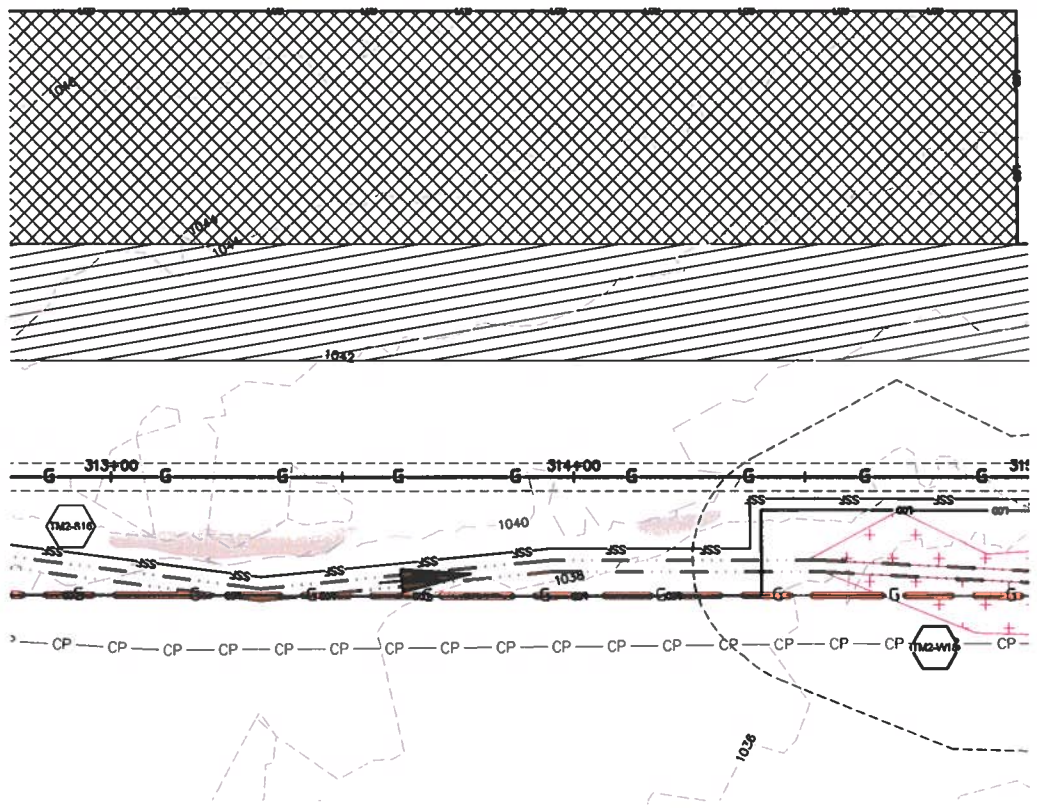
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S14, TM2-W17, AND TM2-S16 CROSSINGS

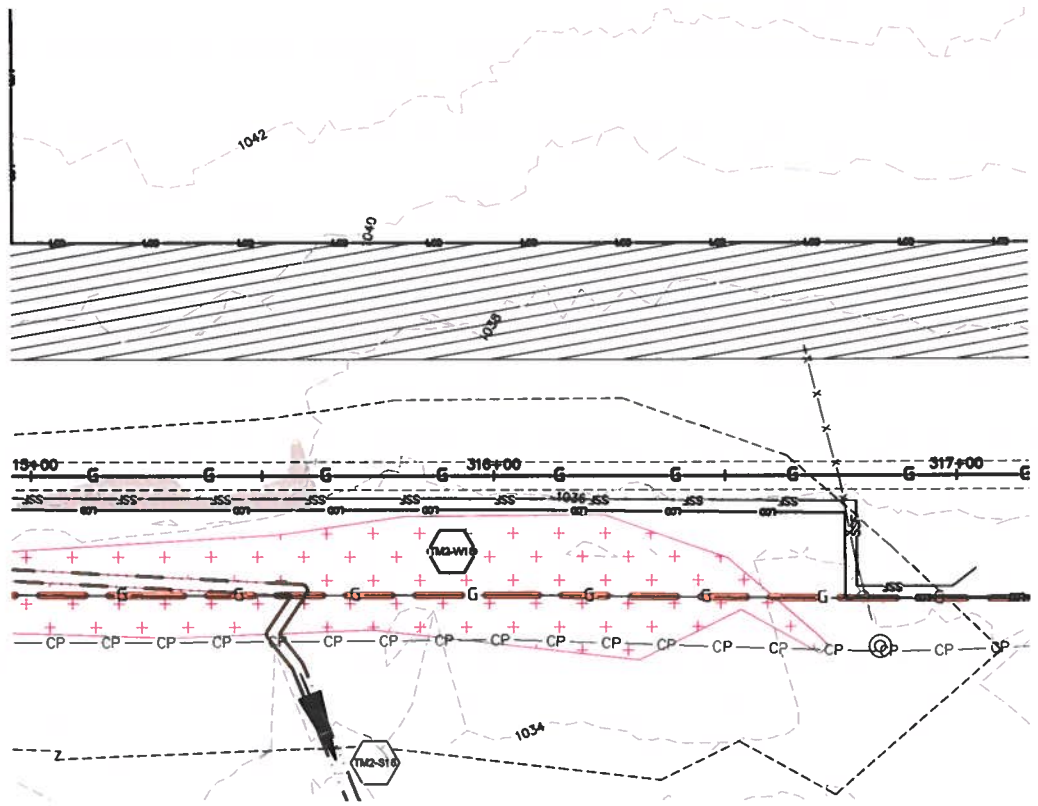
ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-21

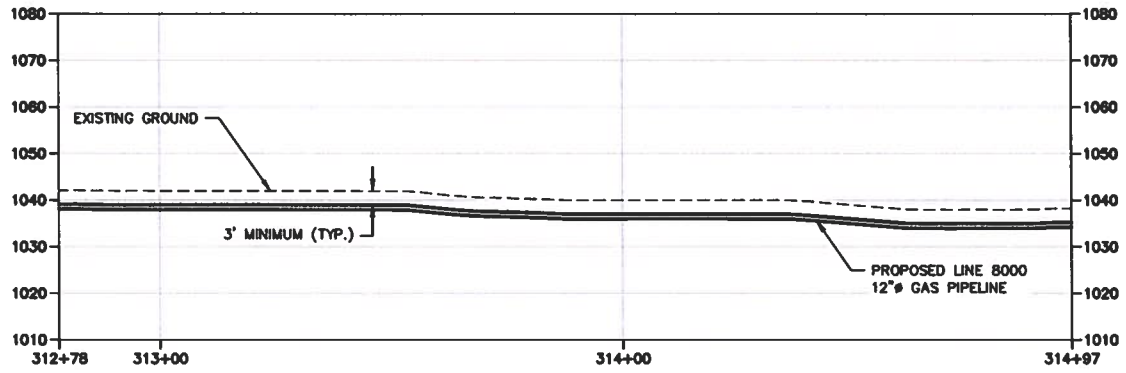


PLAN

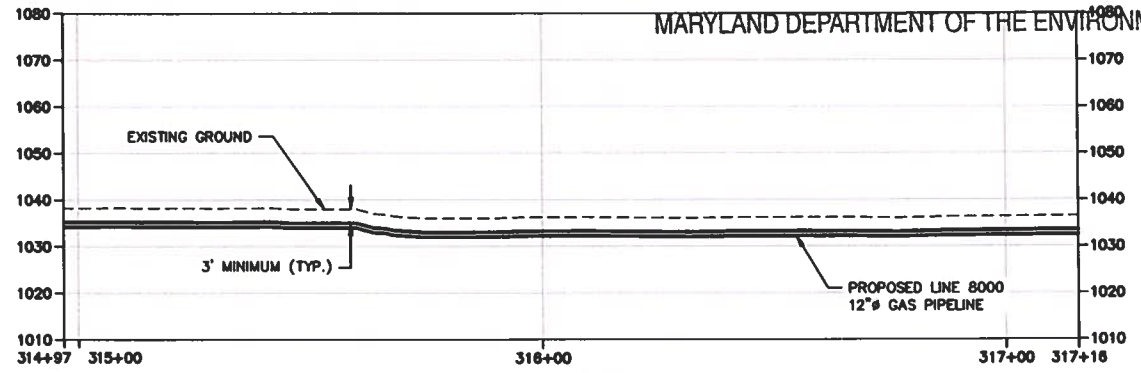


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S16	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM2-W18	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	5,150

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-VGT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

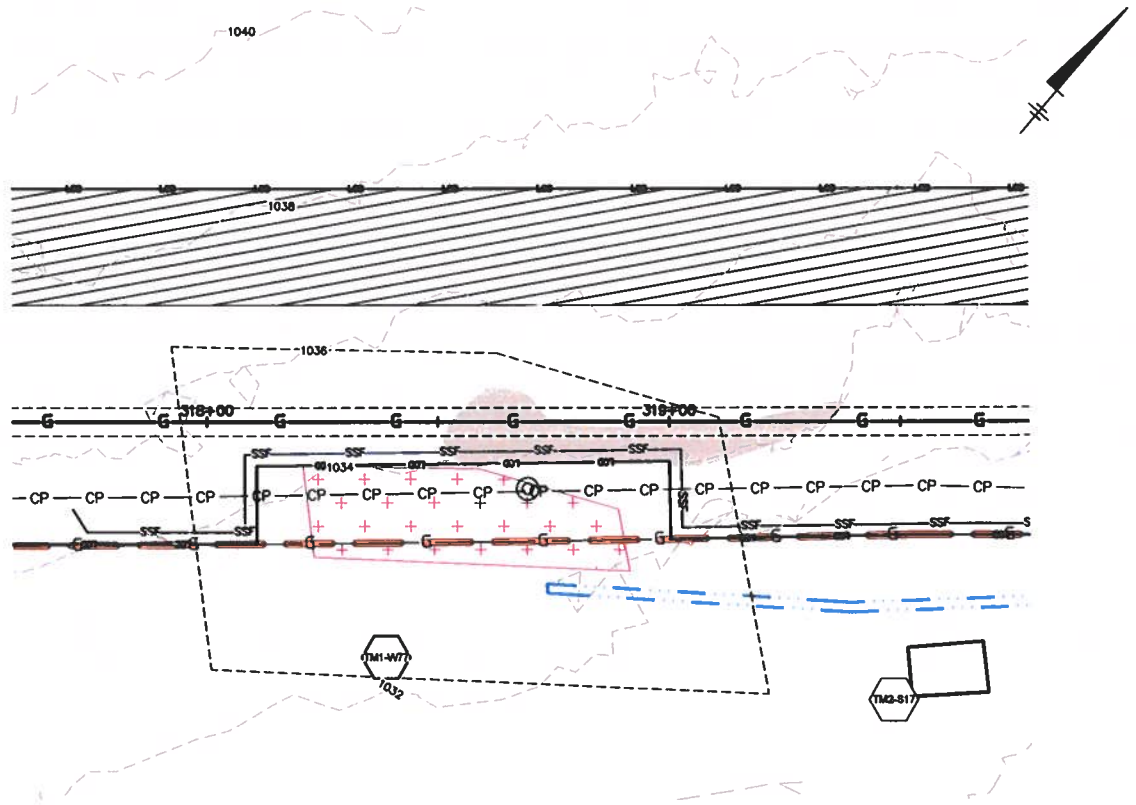
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S16 AND TM2-W18 CROSSINGS

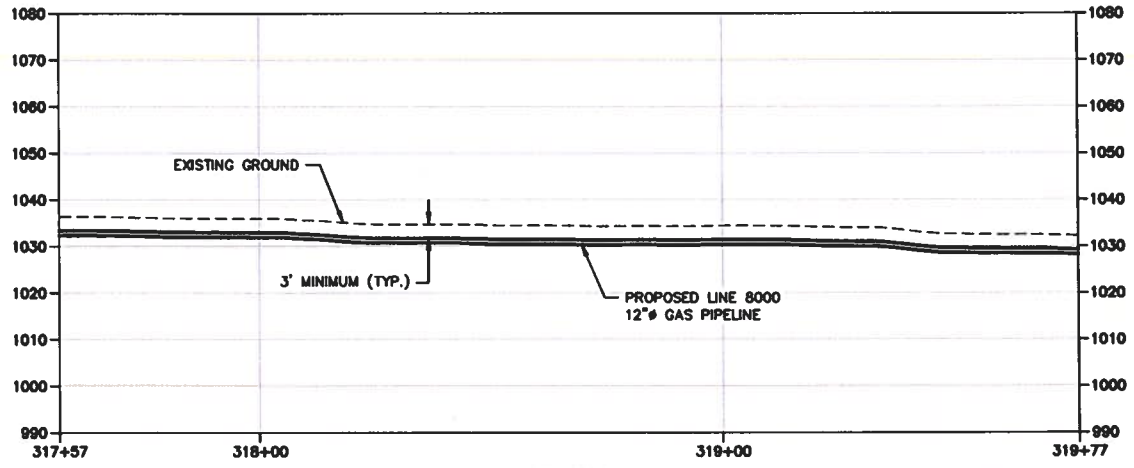
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-22

36 OF 94



PLAN



PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W77	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	2,736
TM2-S17	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PS
CGTL8000-SSC
CGTL8000-XCT
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC.

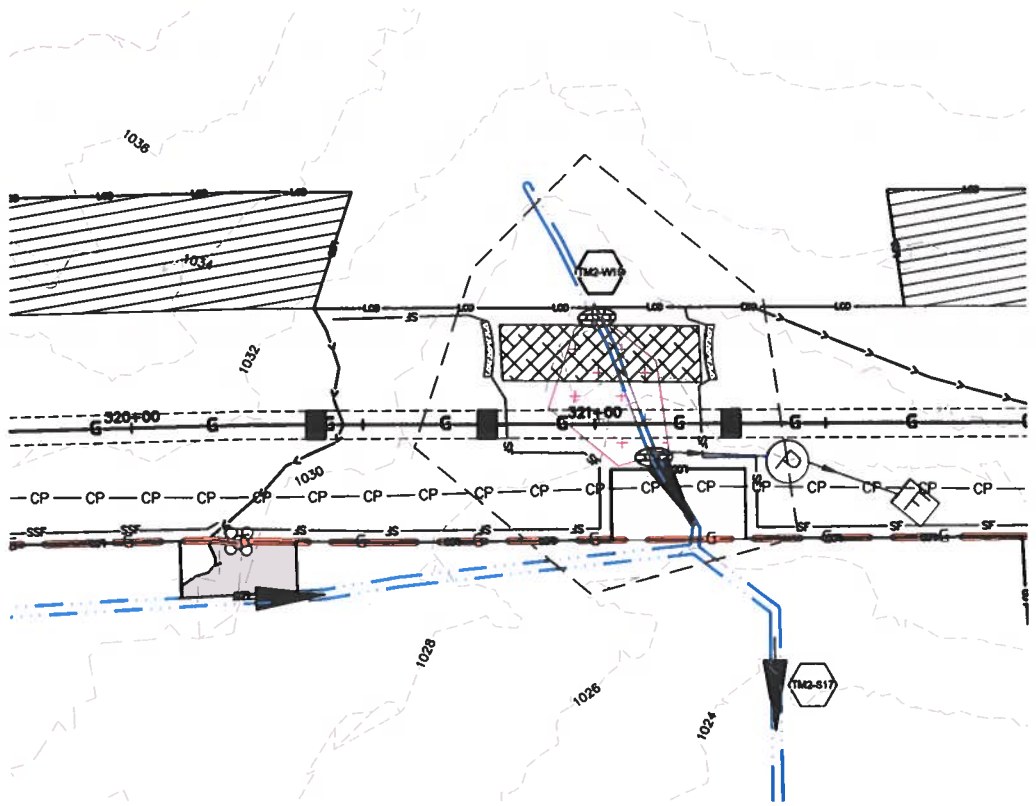
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-W77 CROSSING

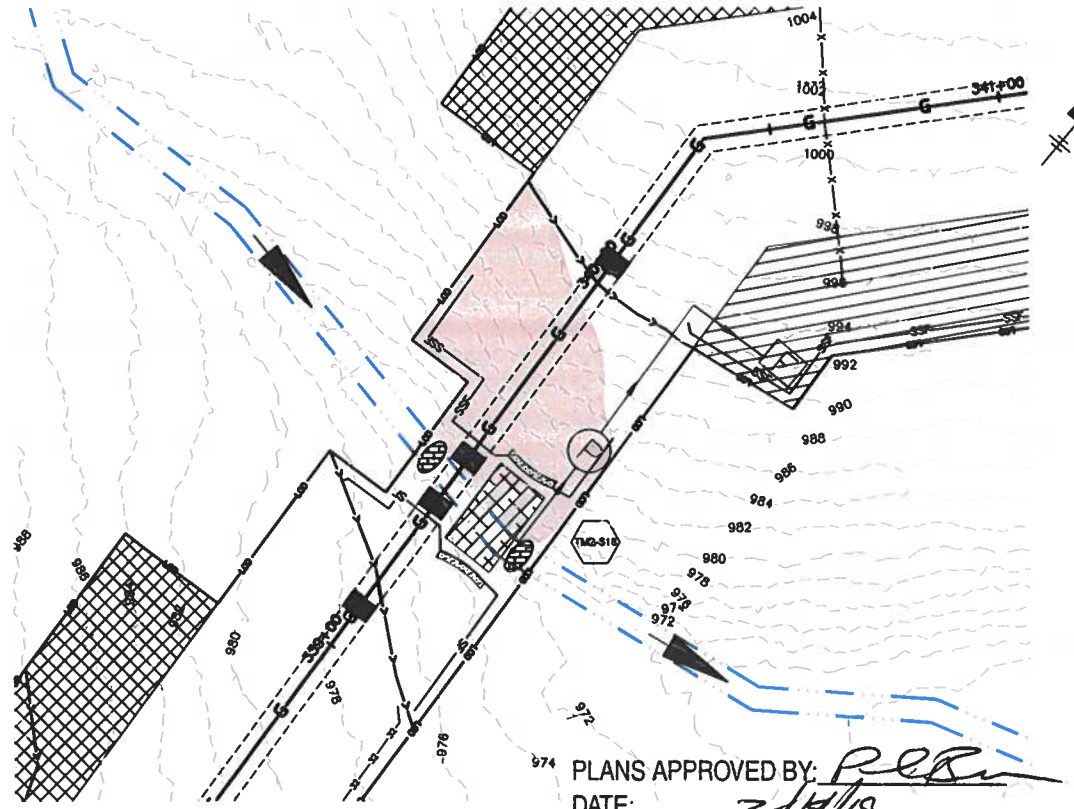
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-22A

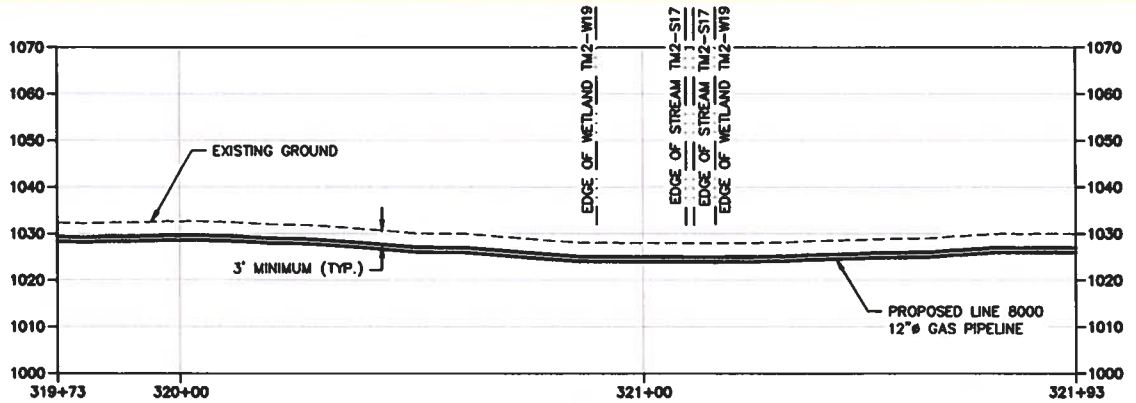


PLAN

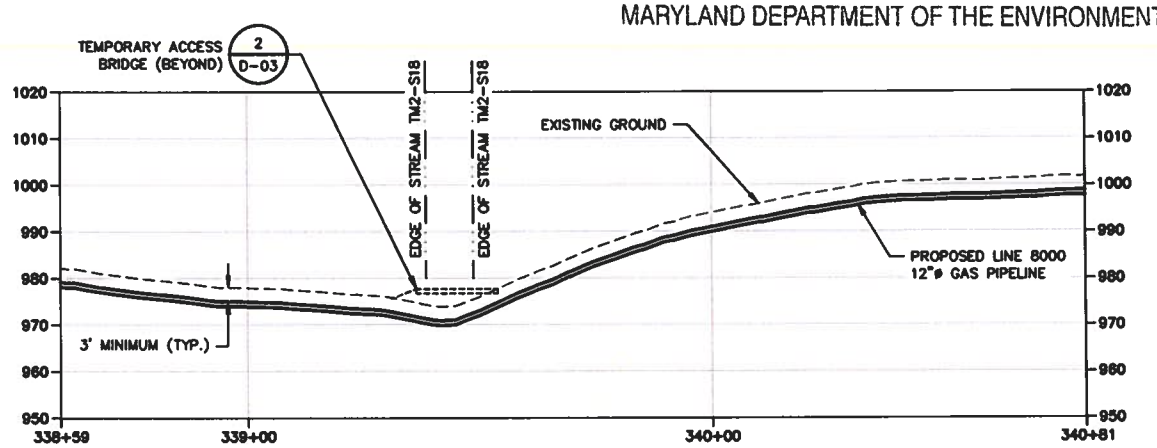


PLAN

PLANS APPROVED BY: _____
DATE: 2/11/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



WETLAND TM2-W19 AND STREAM TM2-S17 PROFILE



STREAM TM2-S18 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S17	R4	5	35	175	N/A	N/A	N/A	N/A	690	N/A	N/A	N/A
TM2-S18	R3	8	30	240	N/A	N/A	N/A	N/A	385	N/A	N/A	N/A
TM2-W19	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	494	N/A	2,503

Notes.
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-SEC
CGTL8000-DET
CGTL8000-PL
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

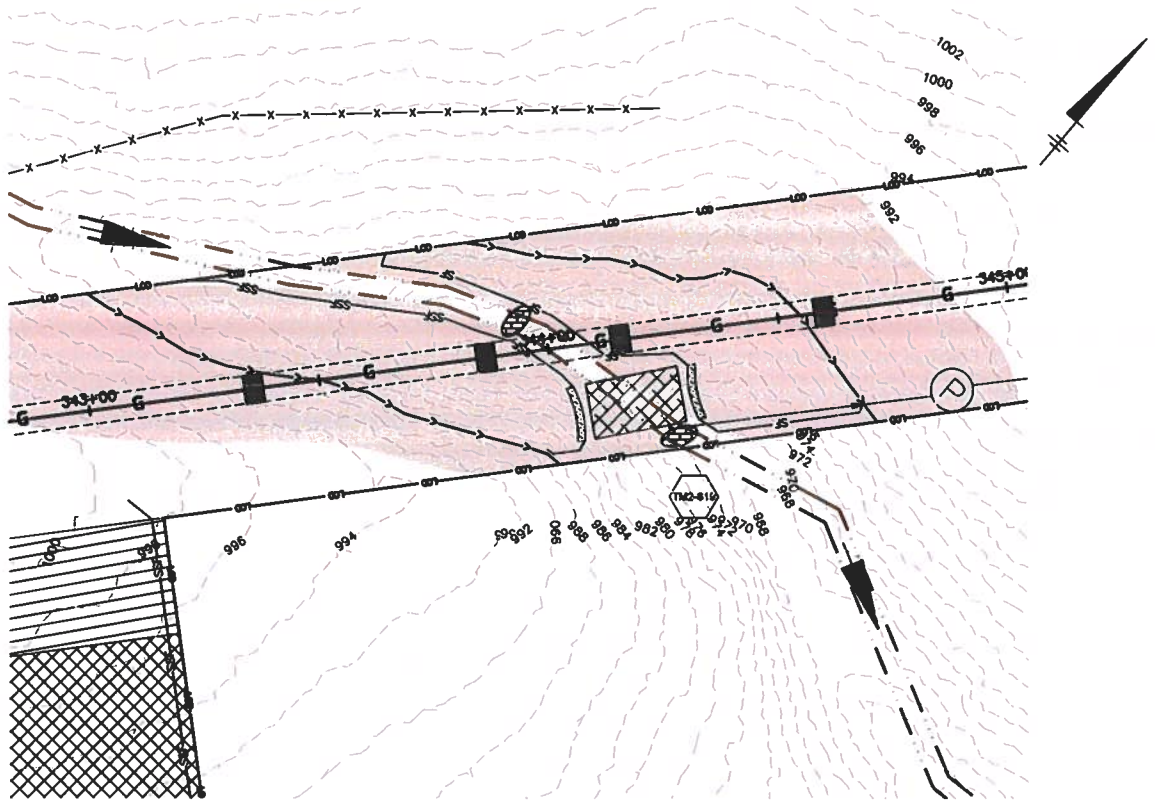
TM2-W19, TM2-S17, AND TM2-S18 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

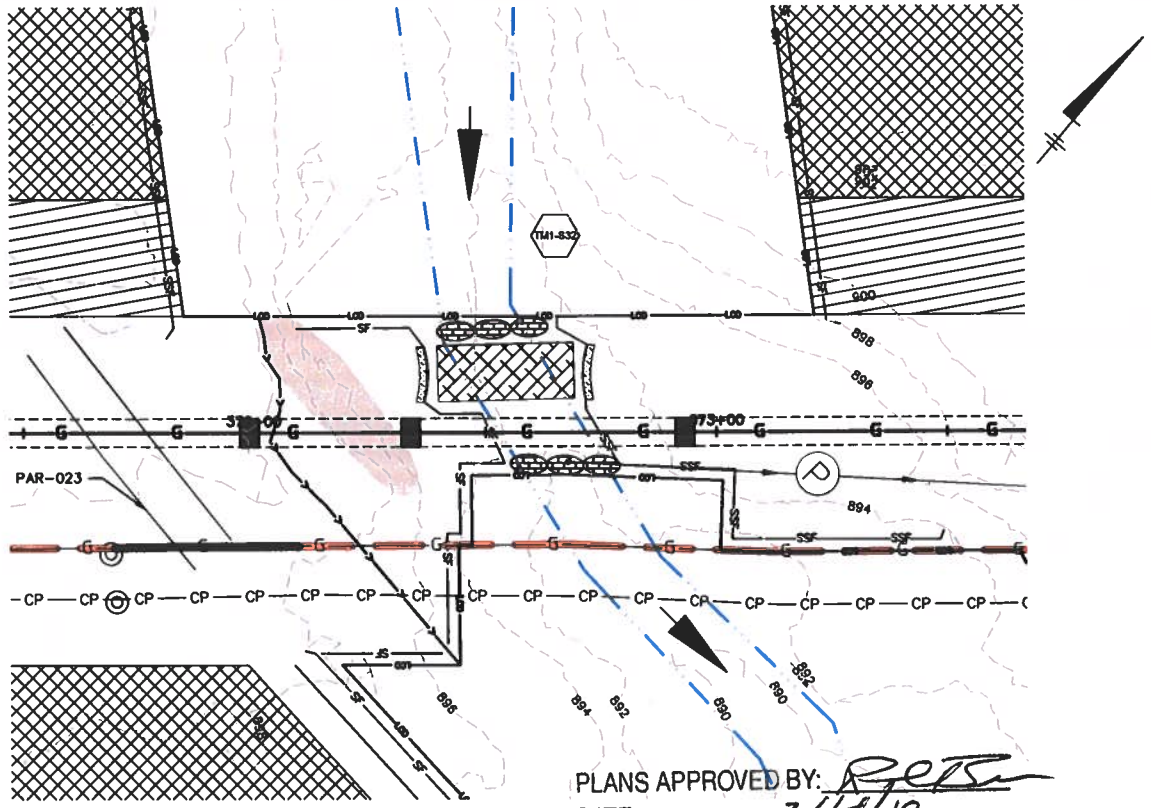
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-23

User:BJACKSON Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGSVX-23.DWG Scale:1:1 SavedDate:7/31/2018 Time:16:05 Plot Date: Steele, Sam; 11/26/2018; 11:21 ; Layout:38

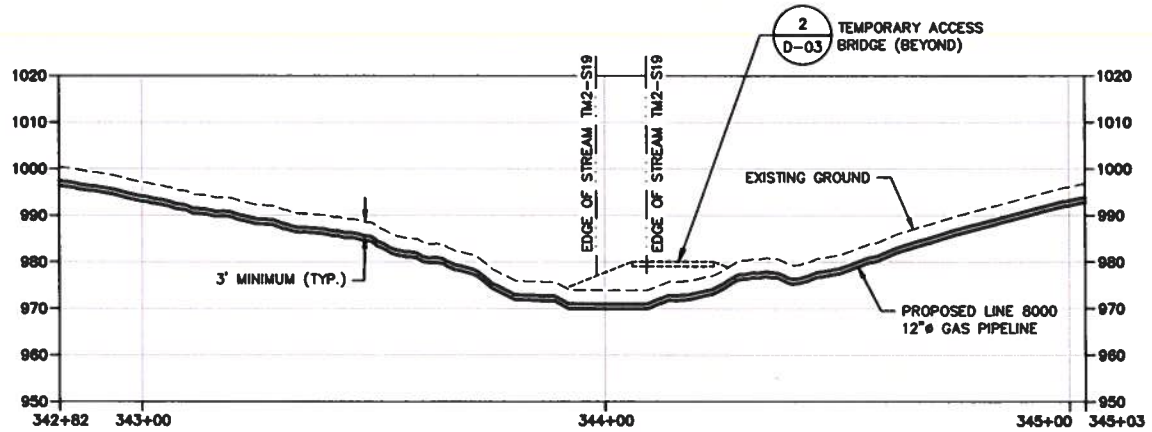


PLAN

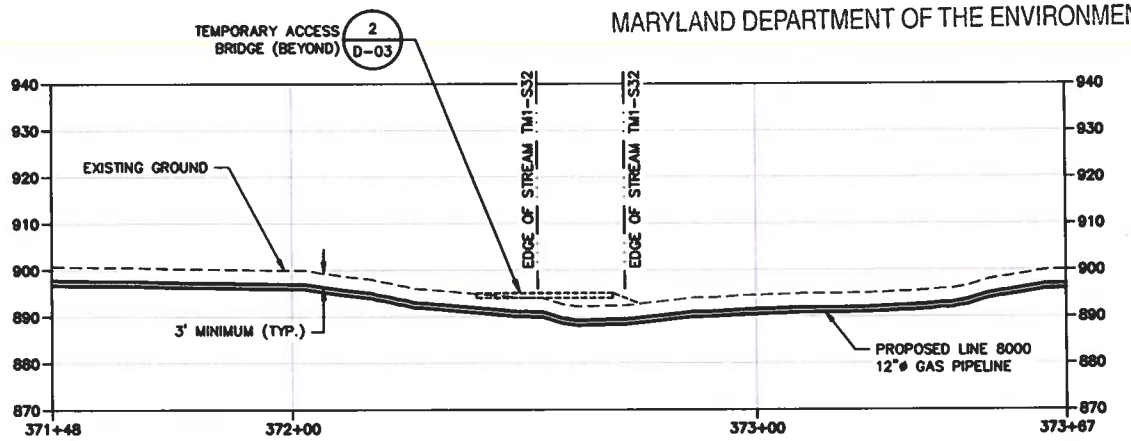


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S19 PROFILE



STREAM TM1-S32 PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF SILT FENCE — 3 D-01
- SSF SUPER SILT FENCE — 4 D-01
- 24" COMPOST FILTER SOCK — 1 D-07
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION — 3 D-03
- TEMPORARY GABION — 3 D-06
- INTERCEPTOR DIVERSION — 1 D-02
- TRENCH PLUG — 2 D-02
- P F PUMP AND FILTER BAG — 3 D-02
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING — 2 D-03, 1 D-04
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) — 1 D-01, 2 D-01
- SOIL STABILIZATION MATTING — 1 D-03
- WEIGHTED SEDIMENT FILTER TUBE — 2 D-04
- BROAD-BASED DIP — 3 D-04
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S32	R3	12	35	420	N/A	N/A	N/A	N/A	525	N/A	N/A	N/A
TM2-S19	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-SIT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

User:BJACKSON Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-24.DWG Scale:1:1 SavedDate:7/31/2018 Time:16:11 Plot Date: Steele, Sam: 11/26/2018; 10:58 ; Layout:39

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

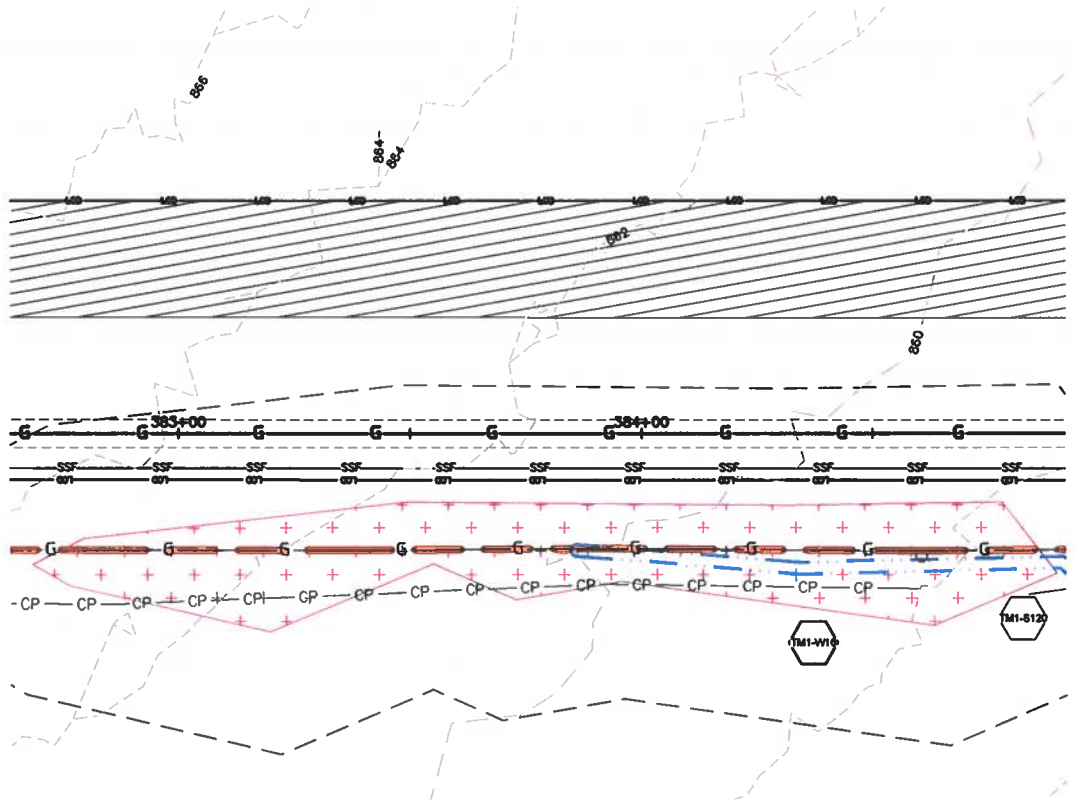
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

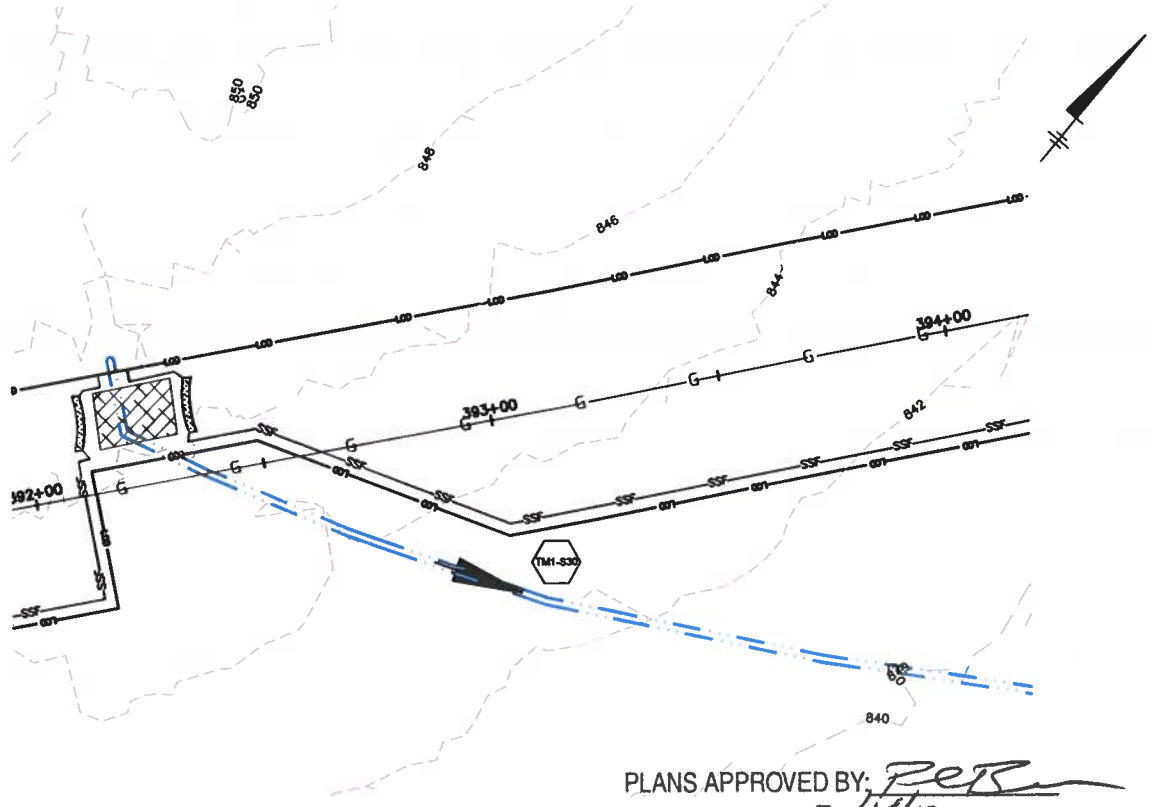
TM2-S19 AND TM1-S32 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-24

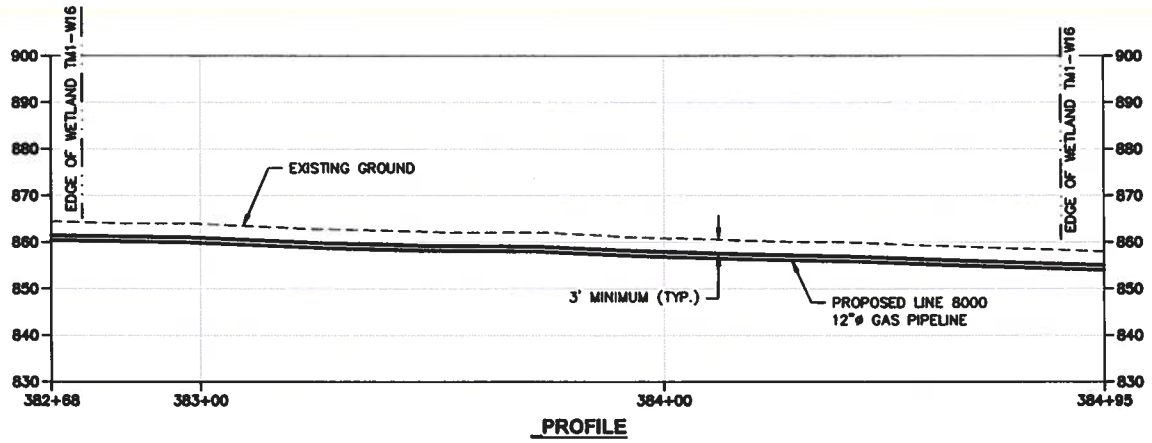


PLAN

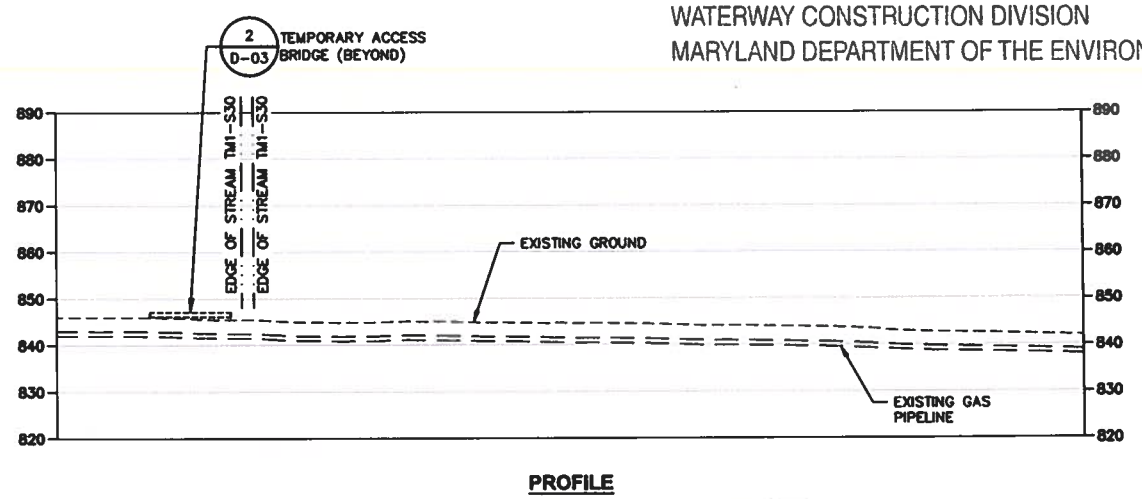


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



PROFILE

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S30	R4	0	0	0	N/A	N/A	N/A	N/A	200	N/A	N/A	N/A
TM1-W16	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	4,728
TM1-S120	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-SEC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

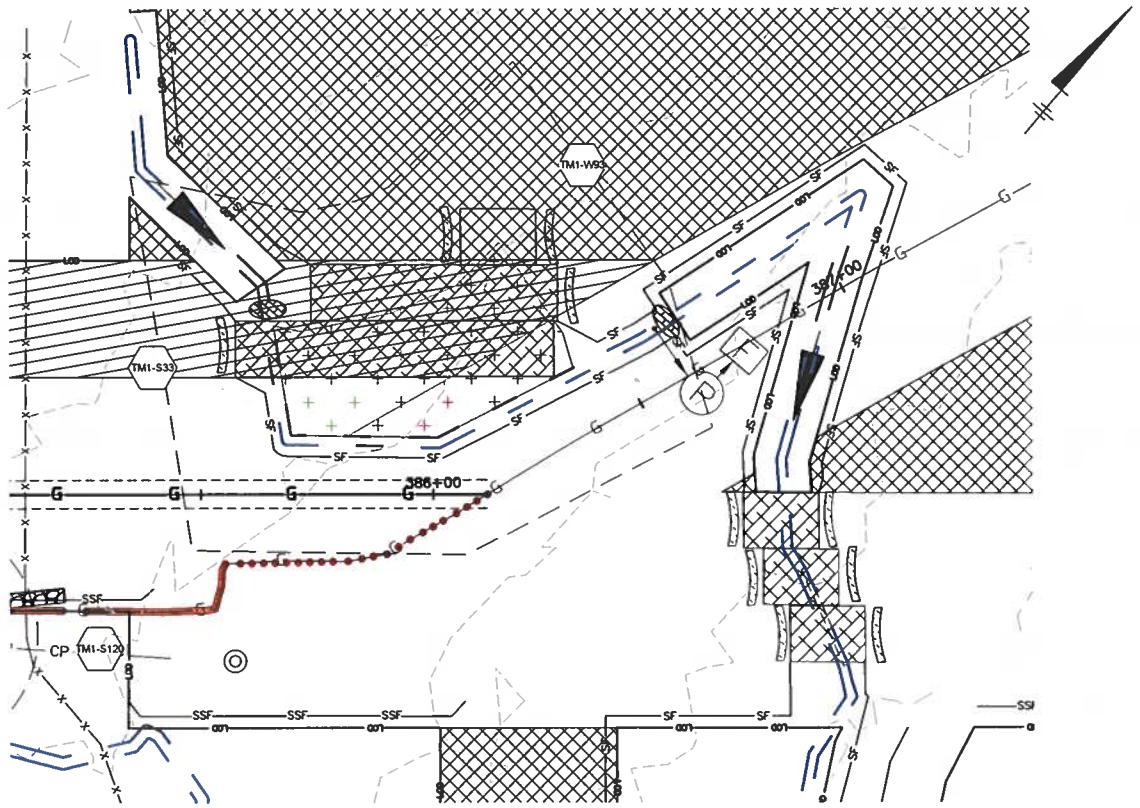
TM1-W16 AND TM1-S30 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

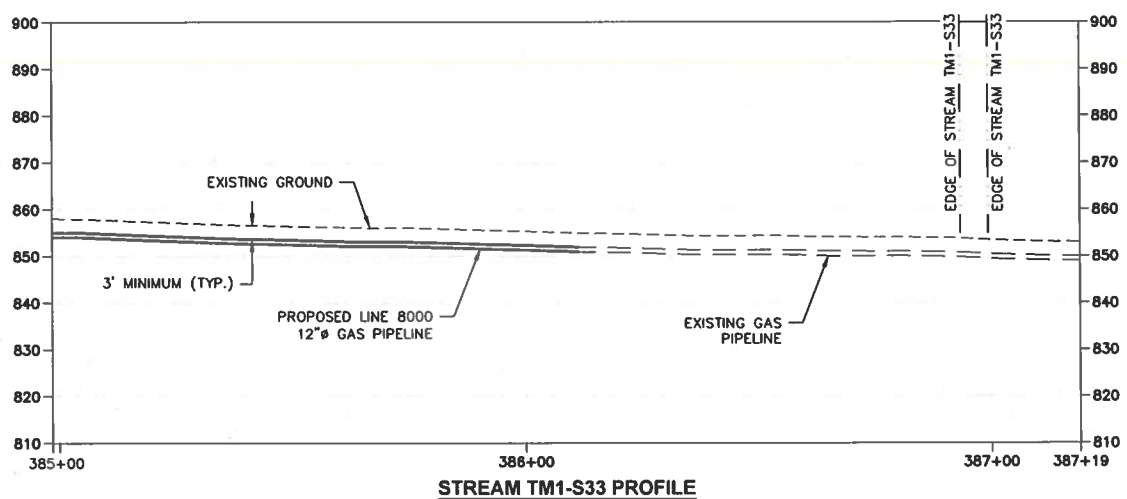
X-25

40 OF 94

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGSX-25.DWG Scale:1:1 SavedDate:11/26/2018 Time:08:07 Plot Date: Duggan, Katie; 11/26/2018, 08:41 ; Layout:40



PLAN



STREAM TM1-S33 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts			Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S33 (new pipe installation)	R4	2	119	238	N/A	N/A	N/A	N/A	N/A	357	N/A	N/A	N/A
TM1-W93	PEM/PFO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	440	1,144	6,601
TM1-S120	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes.
A Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24 24 24 24 — 24" COMPOST FILTER SOCK (1/D-07)
- 32 32 32 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-24x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-ESC
CGTL8000-XCT
IMAGES:
HEXAGON KEYNOTES_60 Scale
HEXAGON KEYNOTES_20 Scale

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CAD\DACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-25A.DWG Scale:1:1 SavedDate:11/27/2018 Time:18:47 Plot Date: Steele, Sam: 12/11/2018, 15:25 - Layout:41

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

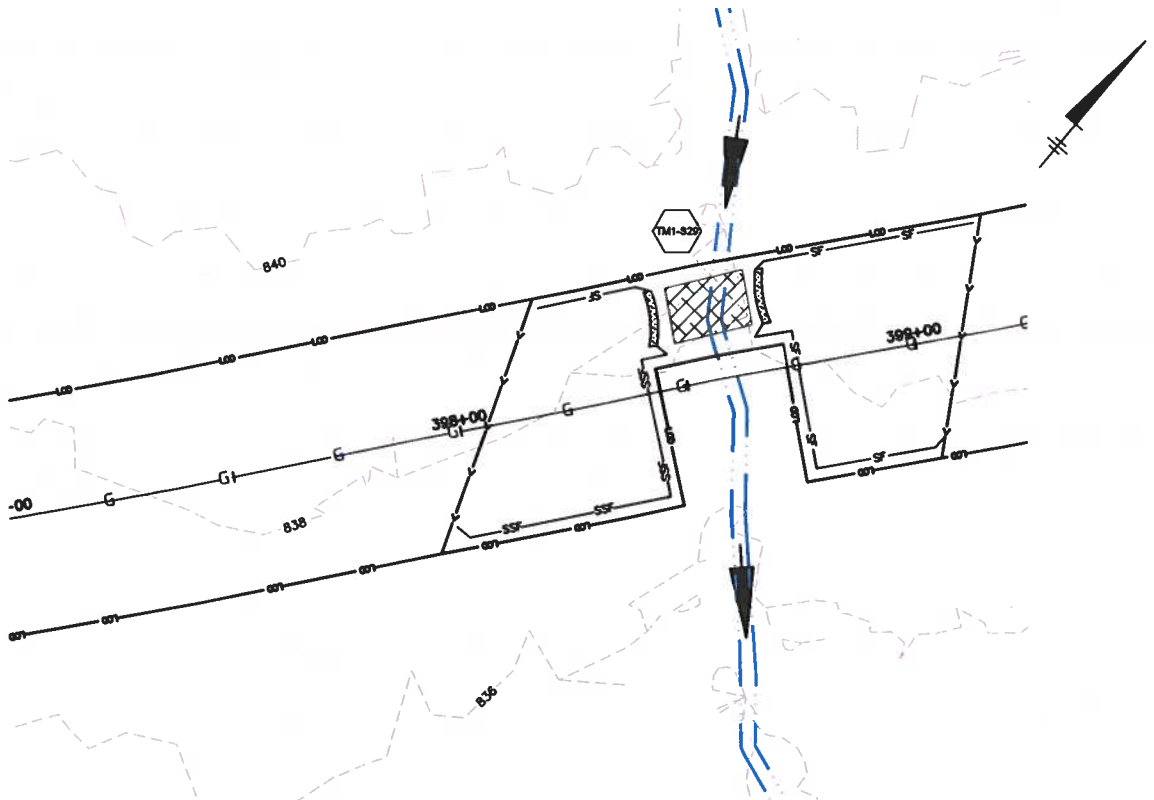
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

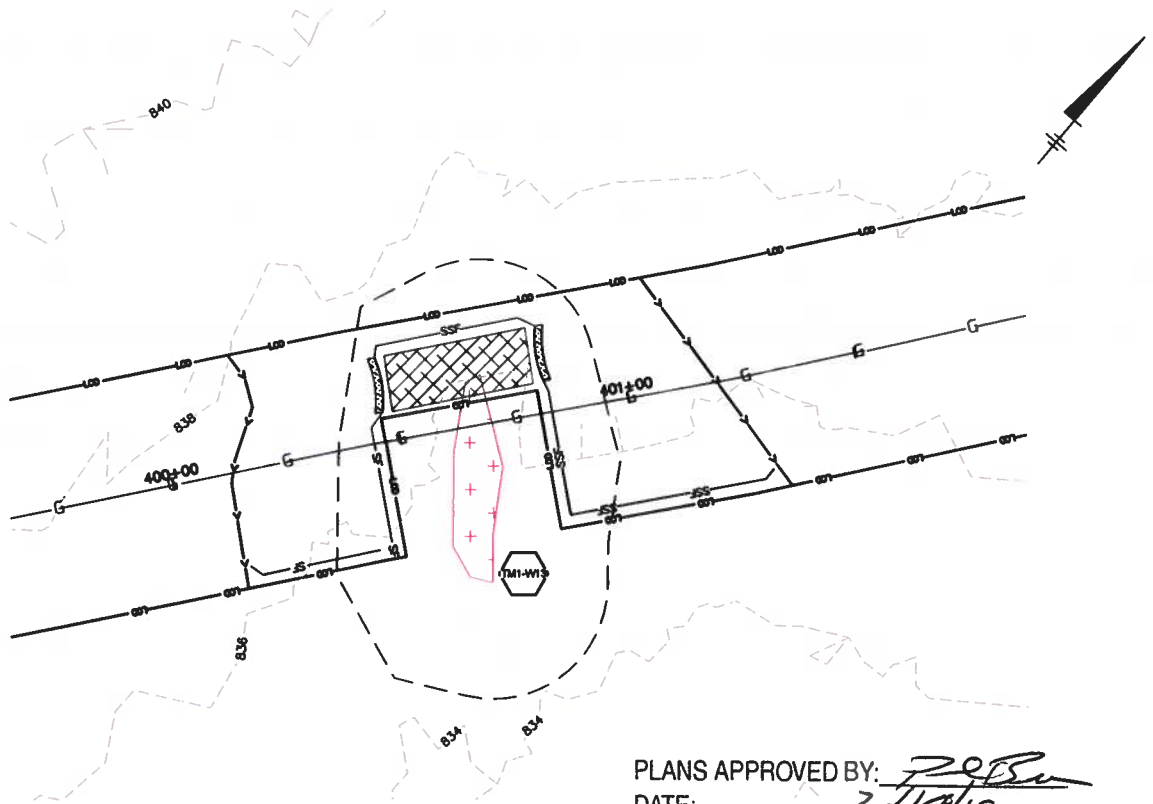
TM1-S33 CROSSING

ARCADIS Project No: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-25A

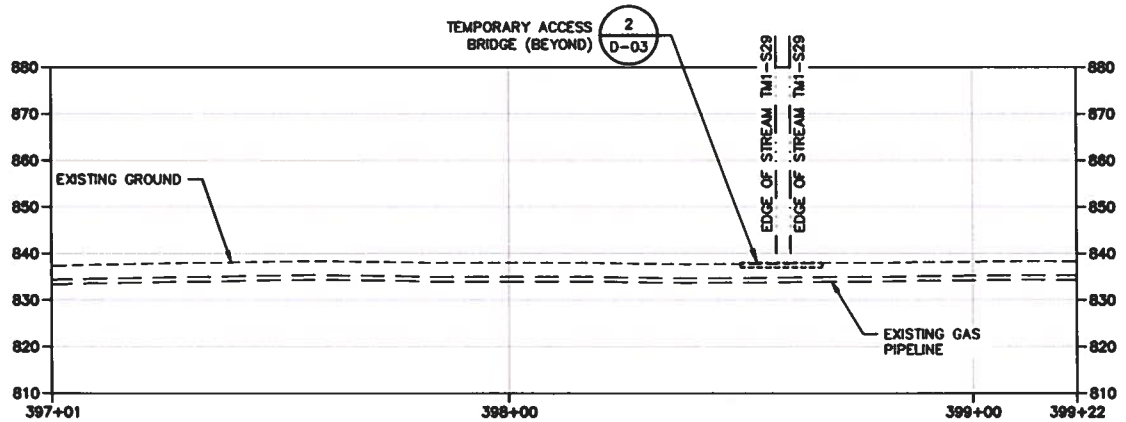


PLAN

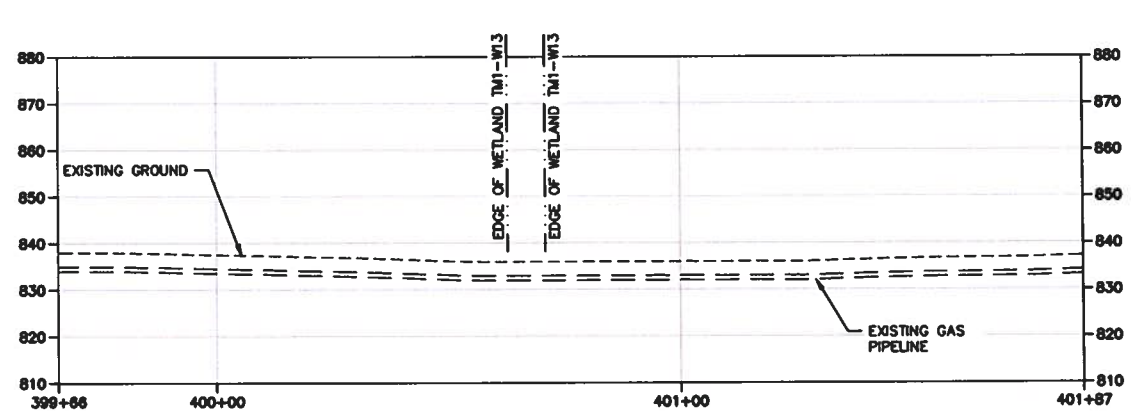


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S29 PROFILE



WETLAND TM1-W13 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S29	R4	0	0	0	N/A	N/A	N/A	N/A	240	N/A	N/A	N/A
TM1-W13	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	21	N/A	1,800

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID (S8, W1)
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF SILT FENCE (3 D-01)
- SSF SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XS-CT
CGTL8000-PL
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

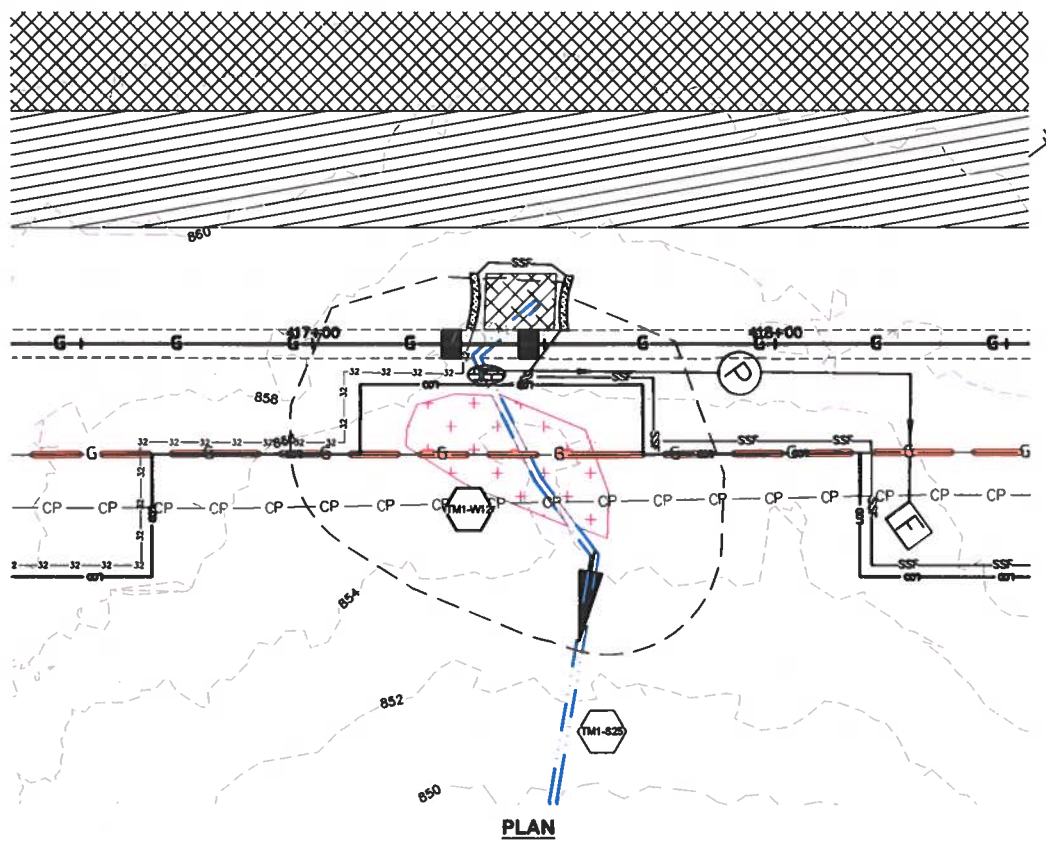
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSINGS TM1-S29 AND TM1-W13

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

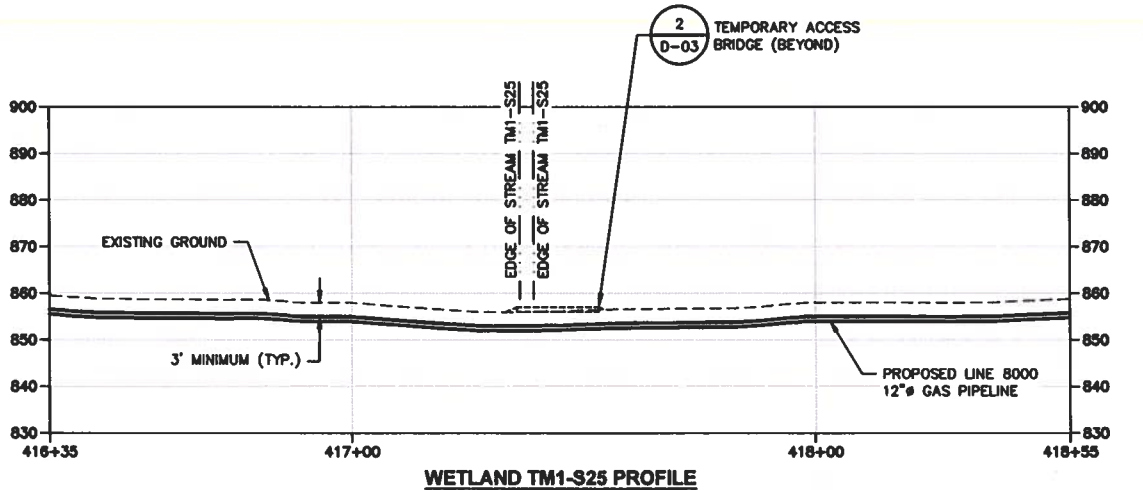
X-26



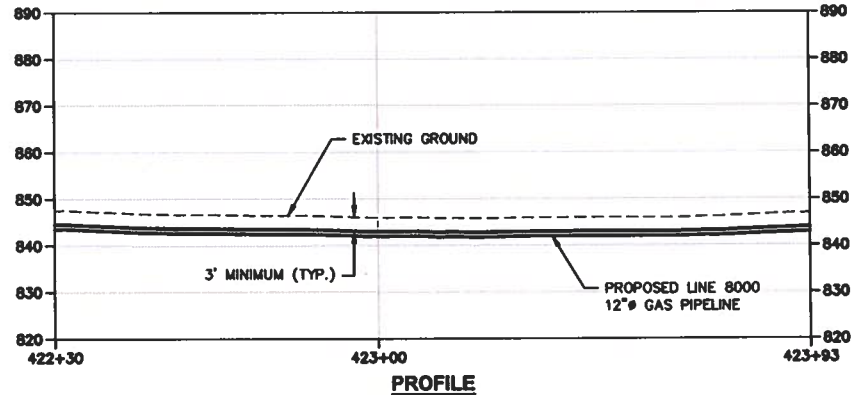
PLAN

PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



WETLAND TM1-S25 PROFILE



PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S25	R4	2	24	48	N/A	N/A	N/A	N/A	45	N/A	N/A	N/A
TM1-W12	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,852
TM1-W10	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,329
TM1-W9	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	7,873

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-LSC
CGTL8000-XCT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

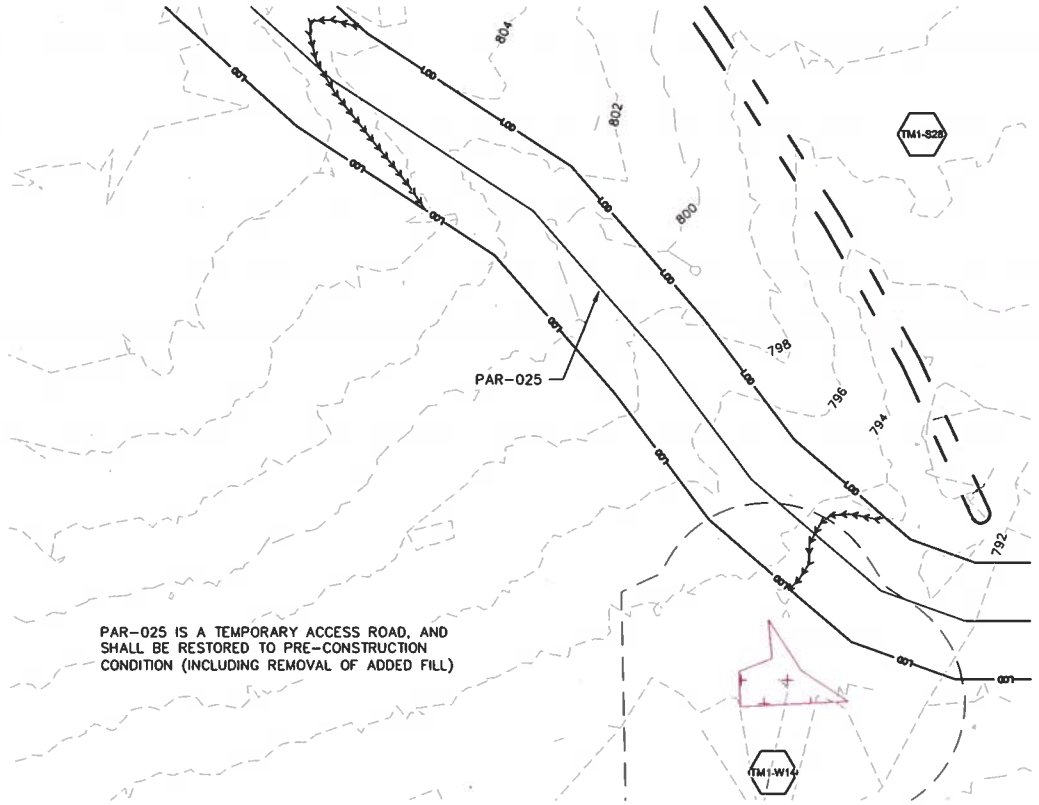
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S25, TM1-W12 AND TM1-W9 CROSSINGS

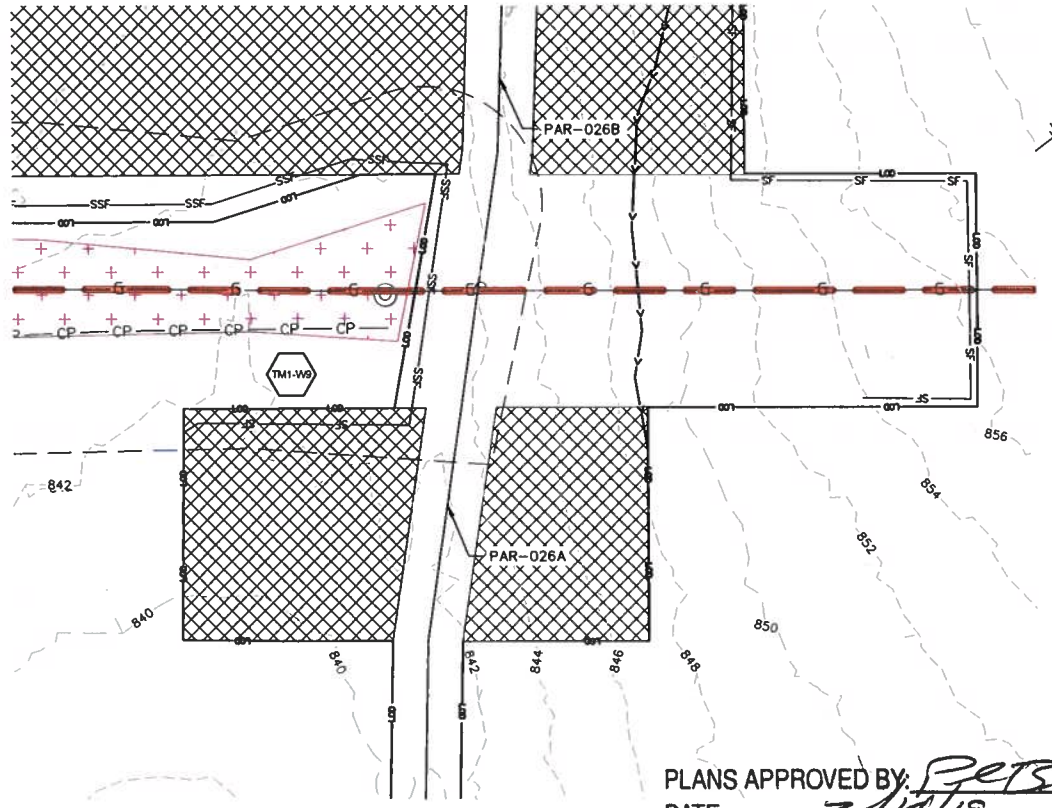
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671.9545

X-27

43 OF 94



PLAN

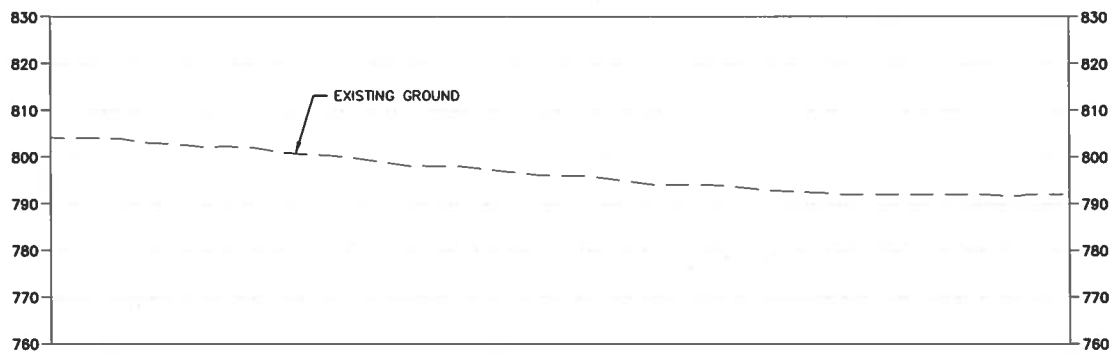


PLAN

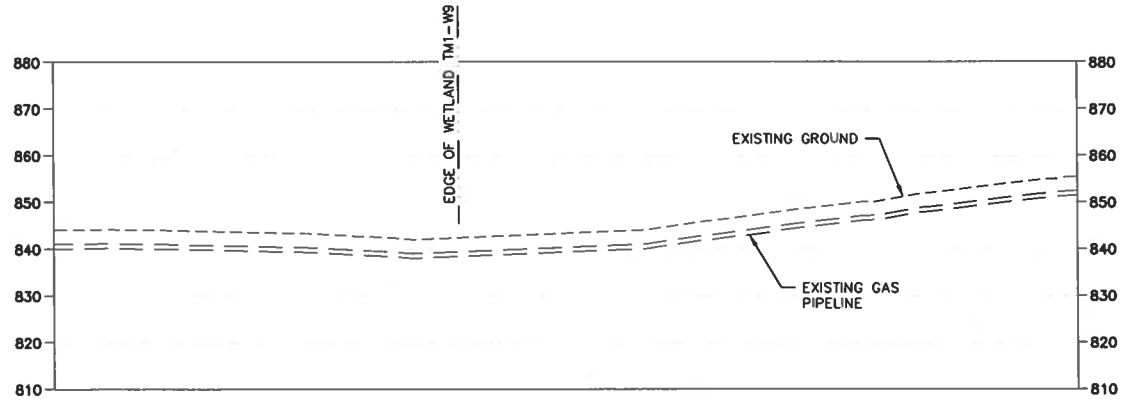
PLANS APPROVED BY: _____
DATE: 11/14/18
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



WETLAND TM1-W14 PROFILE



EXISTING CROSSING WETLAND TM1-W9 PROFILE

Aquatic Resource Crossings													
		Stream Impacts						Floodplain Impacts			Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W9	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	7,873
TM1-S28	R4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1070	N/A	N/A	N/A
TM1-W14	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	766

Notes.
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-XCT
HEXAGON KEYNOTES_60 Scale
HEXAGON KEYNOTES_20 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING

USE TO VERIFY FIGURE REPRODUCTION SCALE

No	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

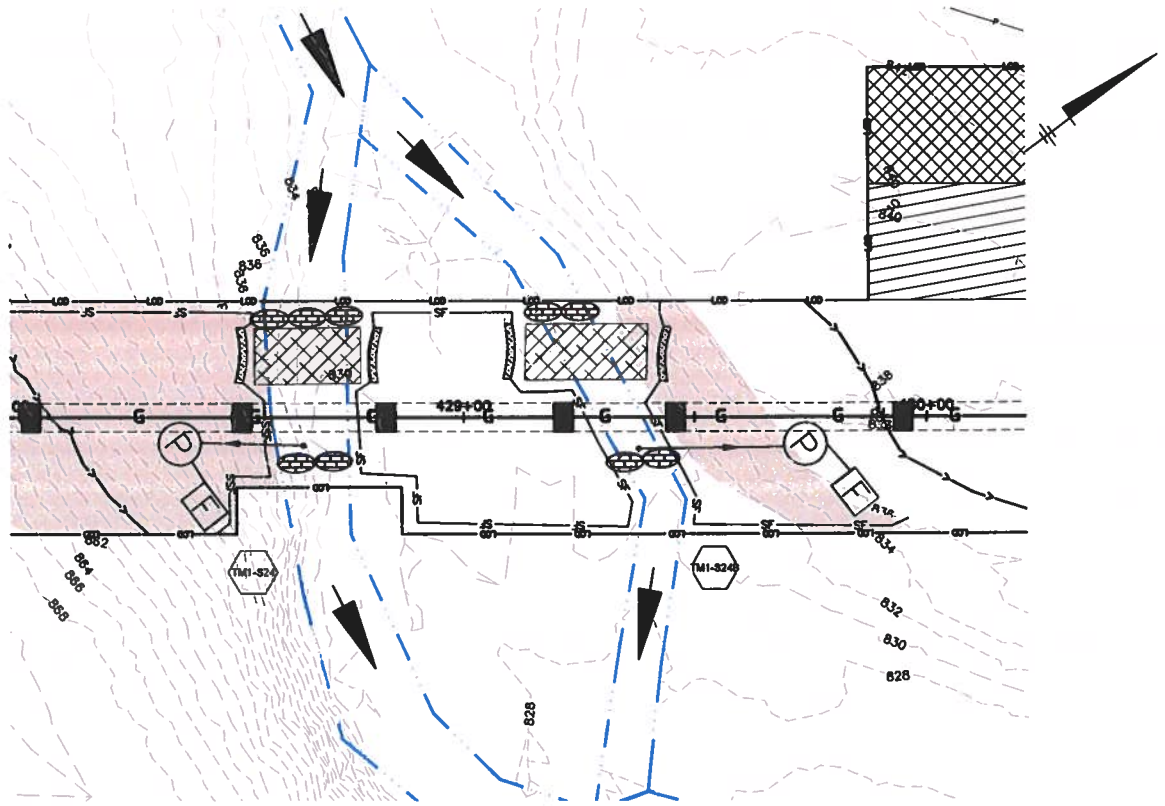
EXISTING CROSSING TM1-W9

ARCADIS Project No.	CGTL8000.0001
Date	NOVEMBER 2018

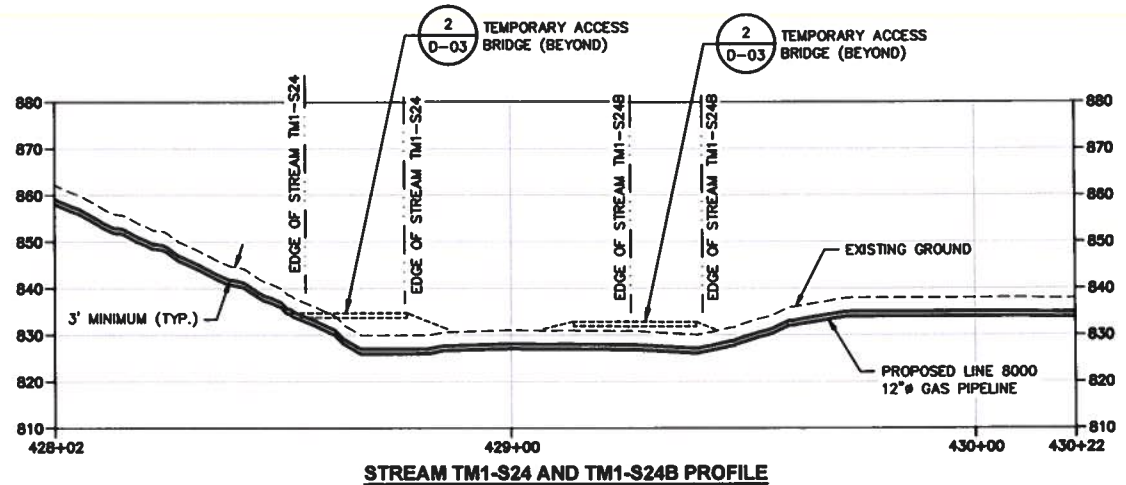
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-28

User:OHUNTER Spec:AUS-NCSMOD File:G:\CAD\ACADPROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-28.DWG Scale:1:1 SavedDate:11/27/2018 Time:18:29 Plot Date: Steele, Sam; 12/11/2018; 14:55 ; Layout:44



PLAN



STREAM TM1-S24 AND TM1-S24B PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S24 (new pipe installation)	R3	17	33	561	N/A	N/A	N/A	N/A	3,680	N/A	N/A	N/A
TM1-S24B	R4	8	38	304	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-SCT
CGTL8000-PL
HEXAGON KEYNOTES

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-29.DWG Scale:1:1 SavedDate:11/28/2018 Time:11:16 Plot Date: Duggan, Katie; 11/28/2018 11:21 ; Layout:46

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

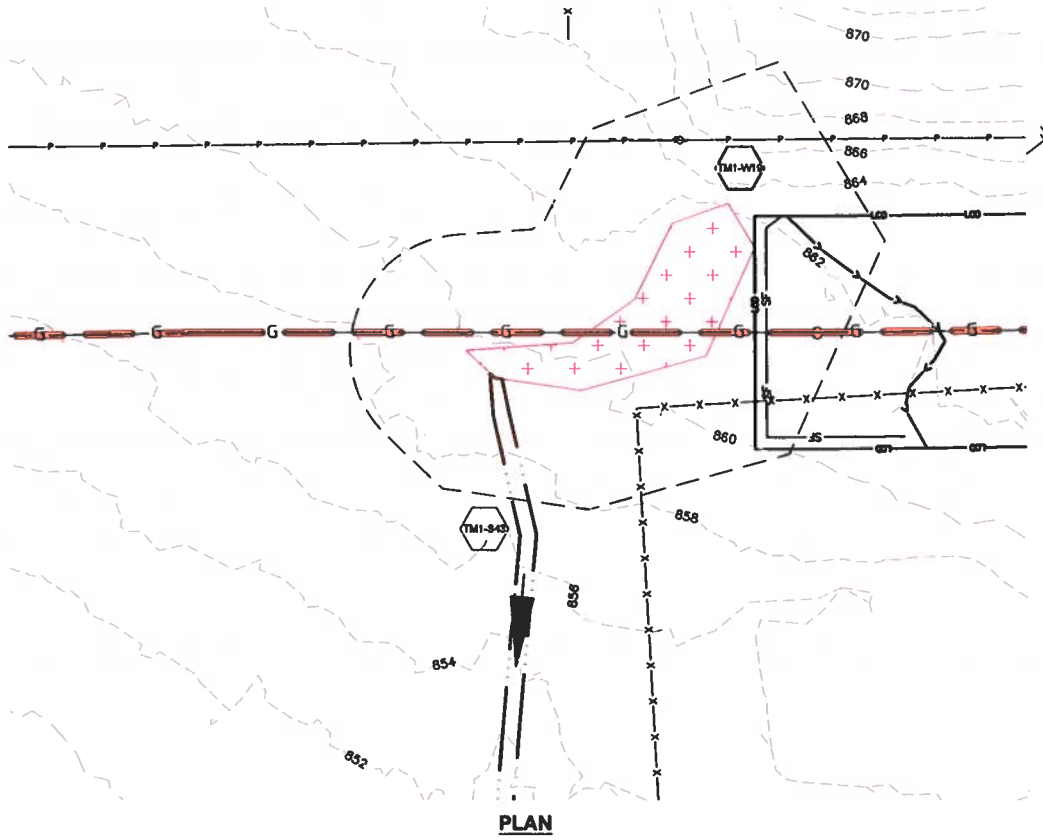
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY ● ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S24 AND TM1-S24B CROSSINGS

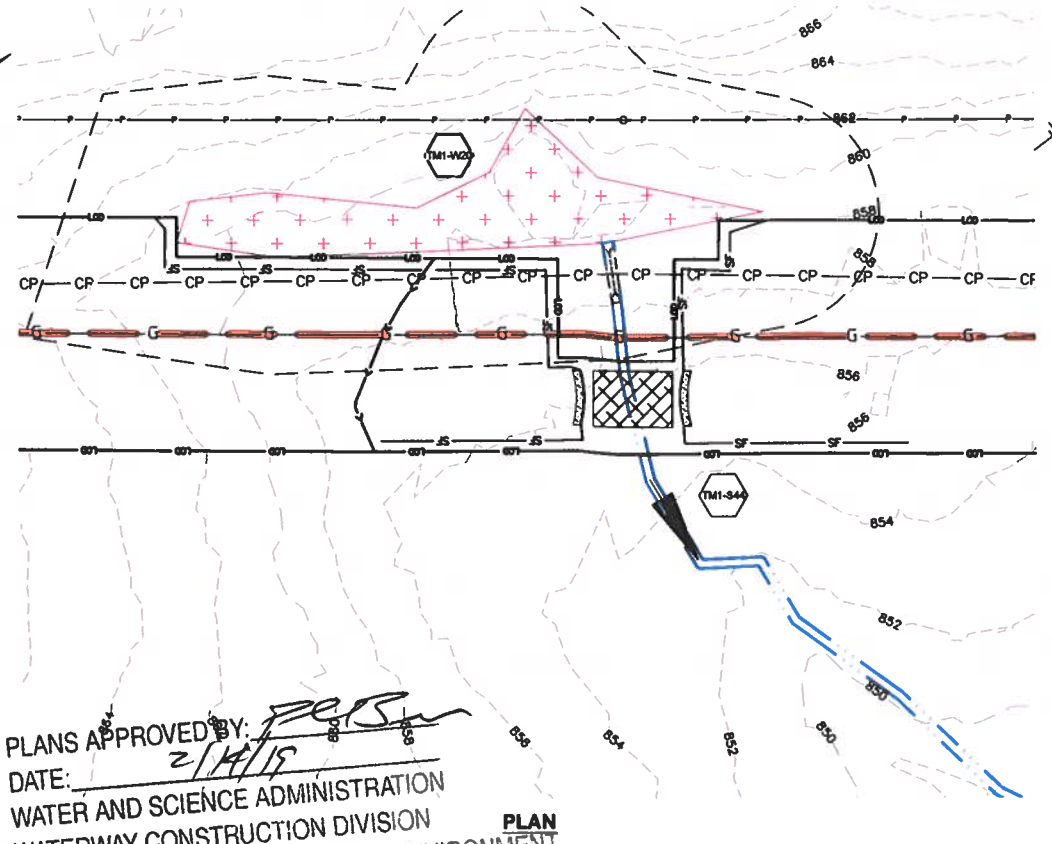
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-29

46 OF 94

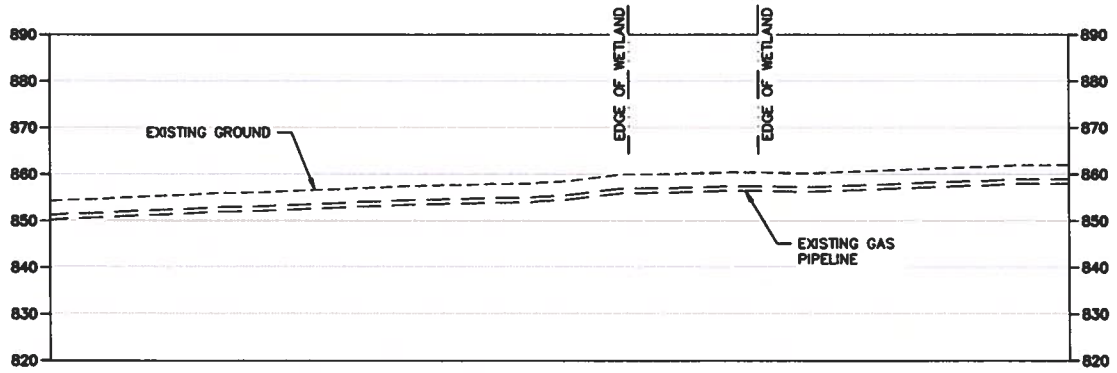


PLAN

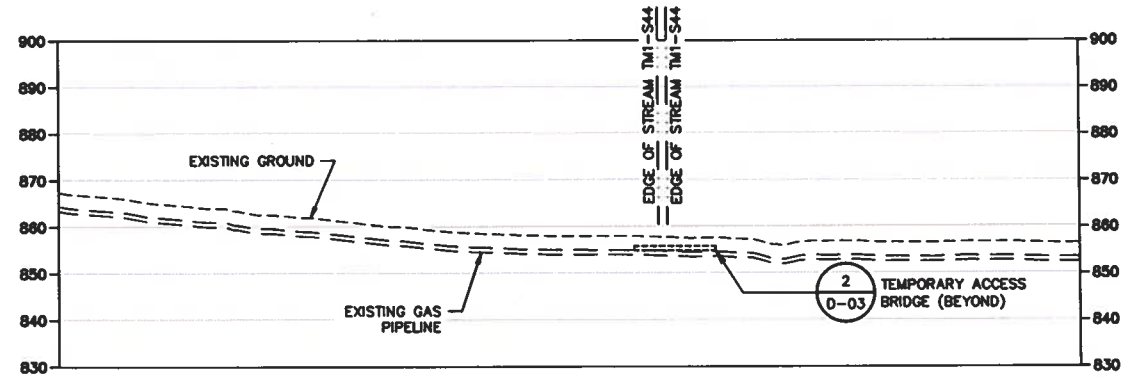


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/4/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



EXISTING CROSSING WETLAND TM1-W19 AND STREAM TM1-S43 PROFILE



EXISTING CROSSING WETLAND TM1-W20 AND TM1-S44 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S44	R4	0	0	0	N/A	N/A	N/A	N/A	300	N/A	N/A	N/A
TM1-W19	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	911
TM1-W20	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	3,442

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01 / 4 D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03 / 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01 / 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-SCT
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

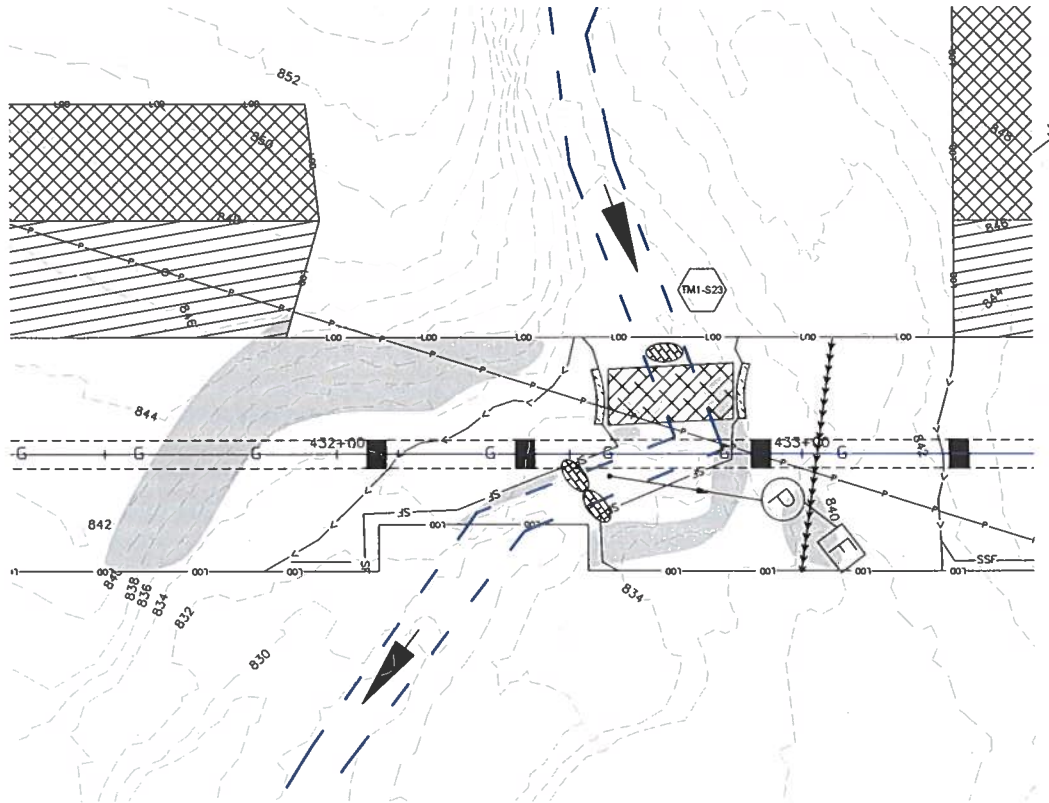
EXISTING CROSSINGS TM1-W19, TM1-S43, TM1-W20 AND TM1-S44

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018

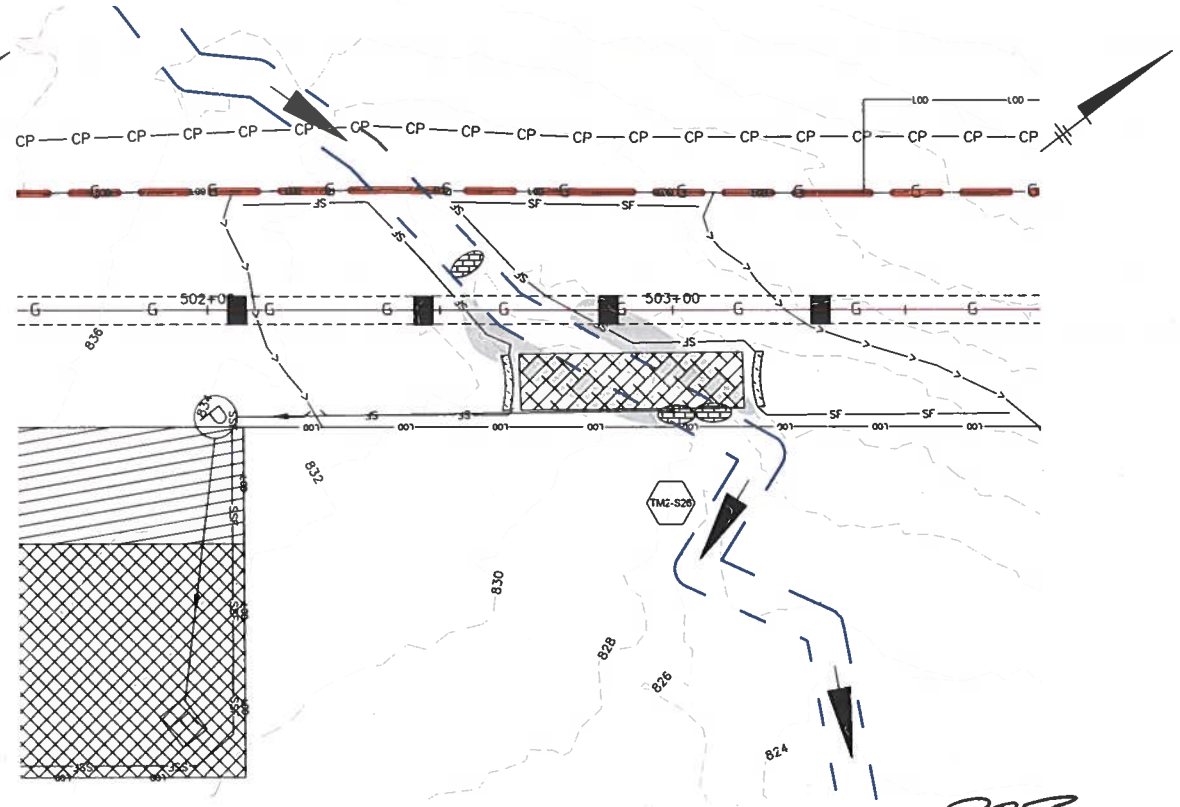
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-30

User:OHUNTER Spec:AUS-NCSMOD File:G:\CADDACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-30.DWG Scale:1:1 SavedDate:8/3/2018 Time:14:52 Plot Date: Steele, Sam; 11/26/2018; 12:40 ; Layout:47

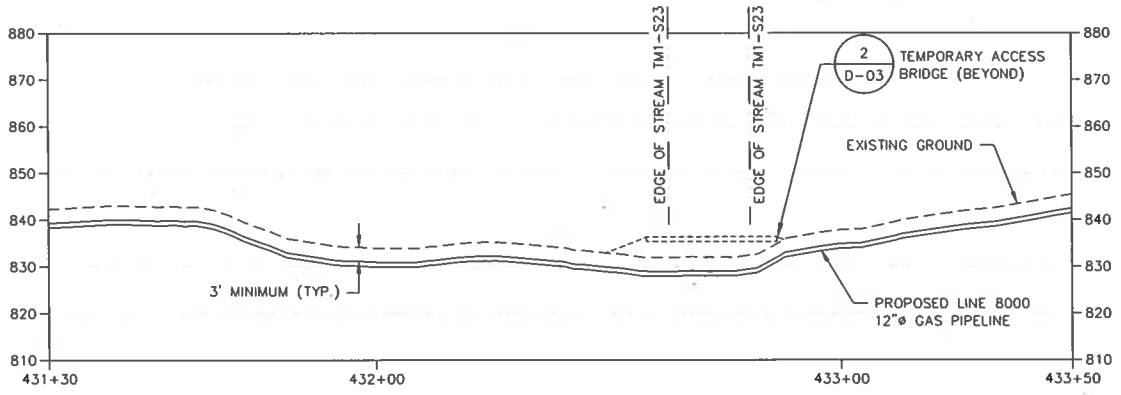


PLAN

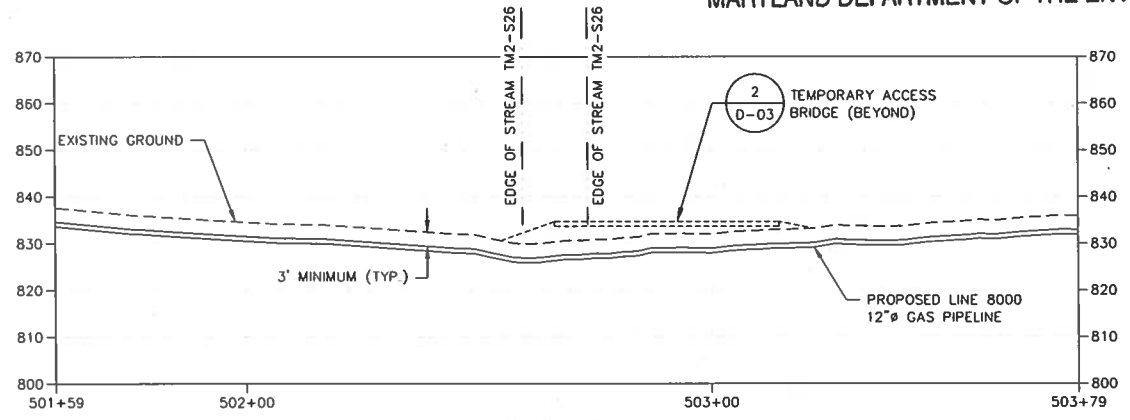


PLAN

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S23 PROFILE



STREAM TM2-S26 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S23 (new pipe installation)	R3	10	49	490	N/A	N/A	N/A	N/A	N/A	1,045	N/A	N/A	N/A
TM2-S26	R4	2	61	122	N/A	N/A	N/A	N/A	N/A	300	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES_60 Scale
HEXAGON KEYNOTES_20 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

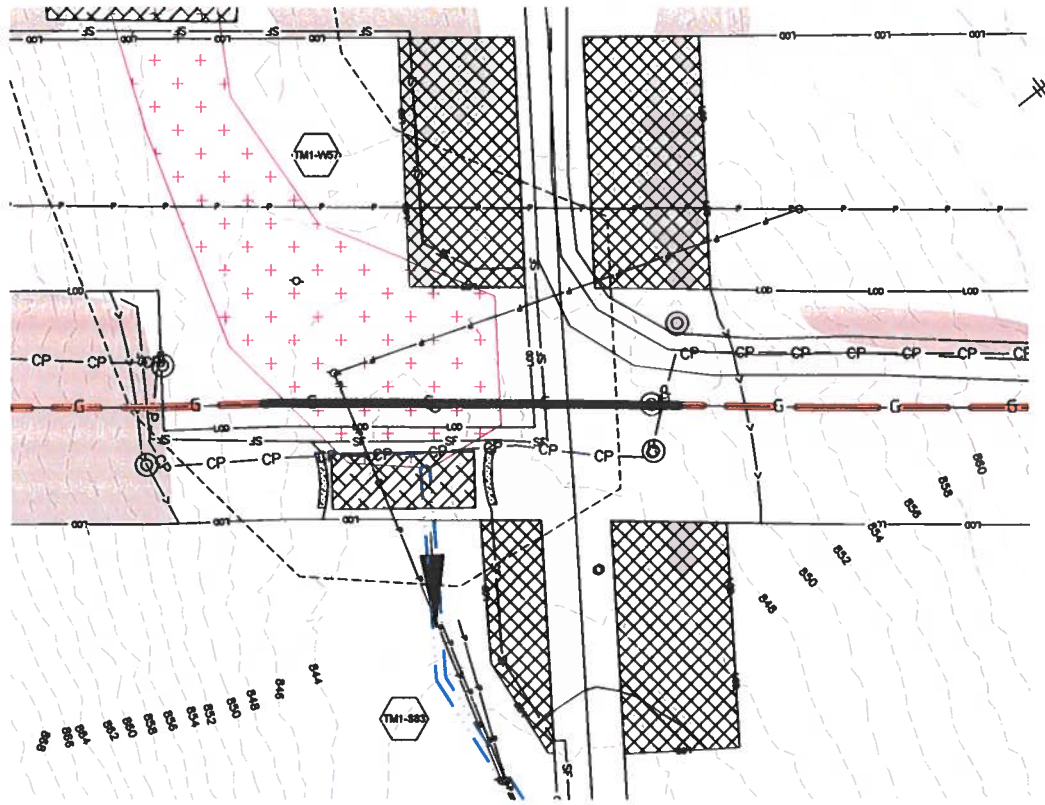
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S23 AND TM2-S26 CROSSINGS

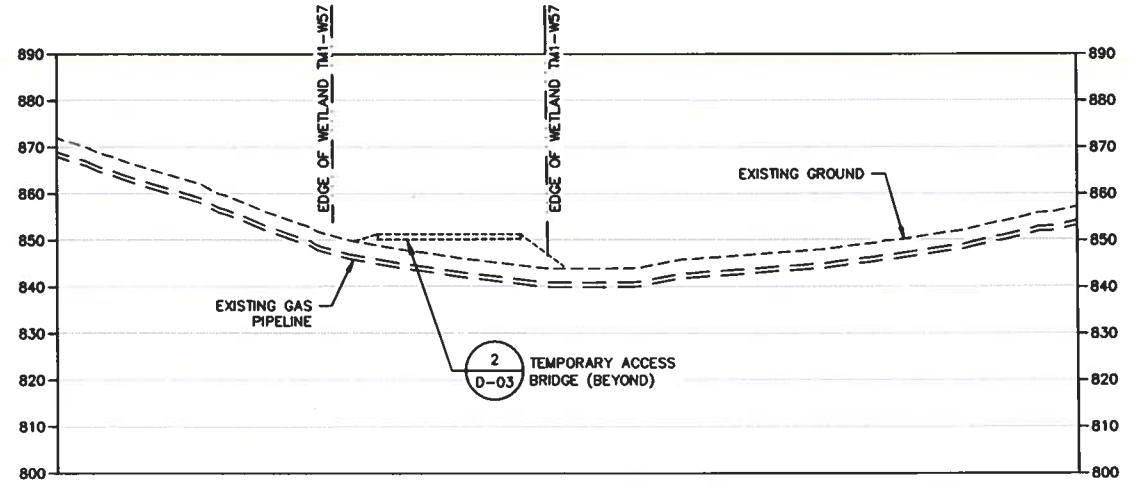
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel: 315.671.9545

X-31

48 OF 94



PLAN



EXISTING CROSSING WETLAND TM1-W57 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S83	R4	0	0	0	N/A	N/A	N/A	N/A	400	N/A	N/A	N/A
TM1-W57 (existing ROW for access)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	242	N/A	1,303

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

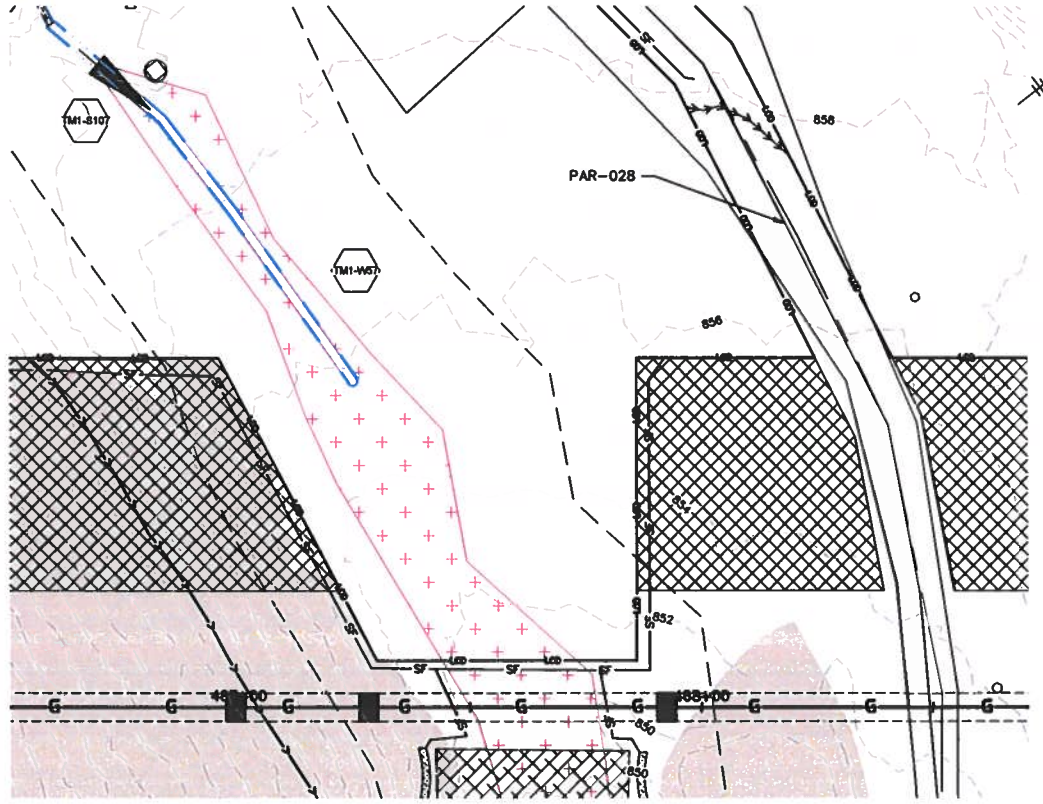
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSING TM1-W57

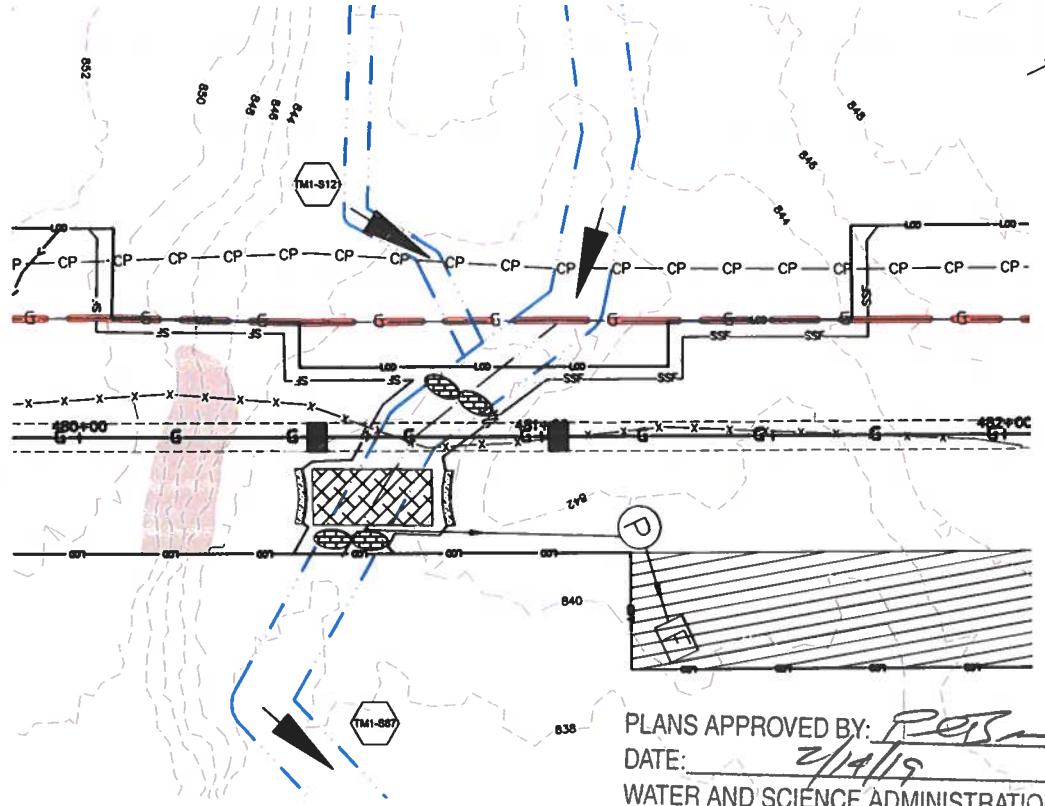
ARCADIS Project No.	CGTL8000.0001
Date	NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-31A

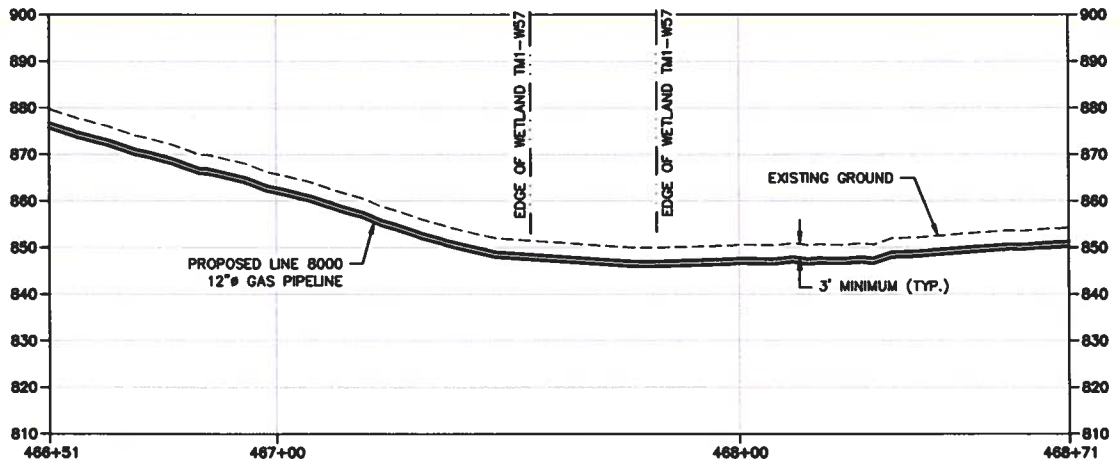


PLAN

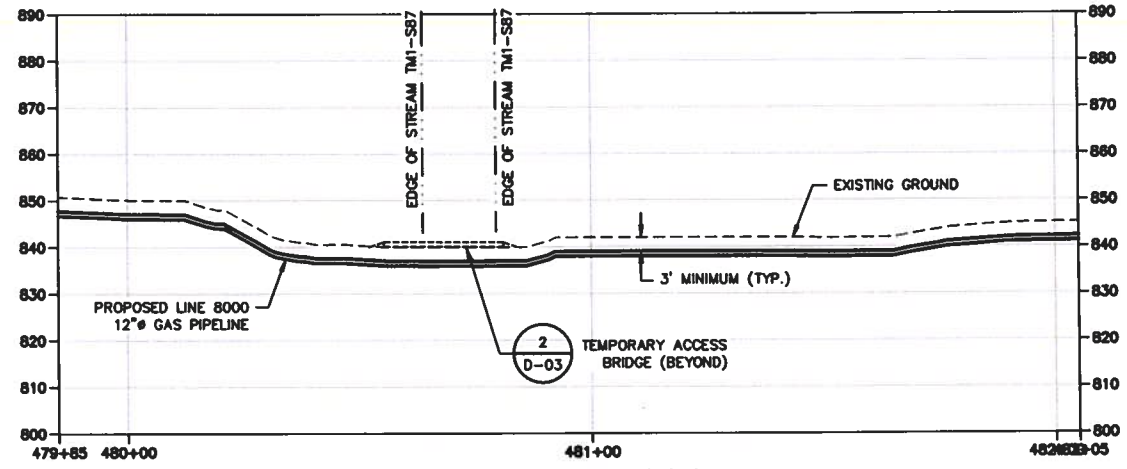


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



WETLAND TM1-W57 PROFILE



STREAM TM1-S87 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W57 (new pipe installation)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	944	N/A	5,211
TM1-S87 (new pipe installation)	R3	12	40	480	N/A	N/A	N/A	N/A	440	N/A	N/A	N/A
TM1-S121 (new pipe installation)	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PSL
CGTL8000-MISC
CGTL8000-XCT
IMAGES:
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

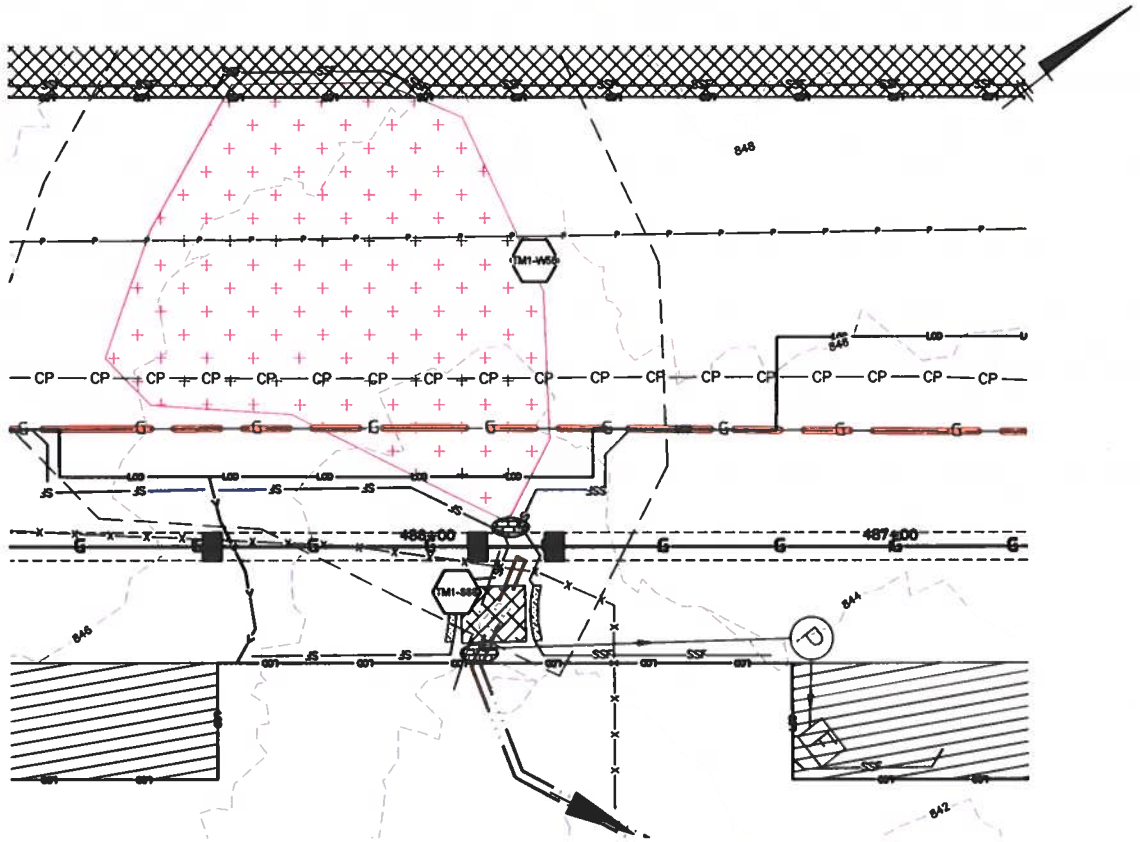
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-W57 AND TM1-S87 CROSSING

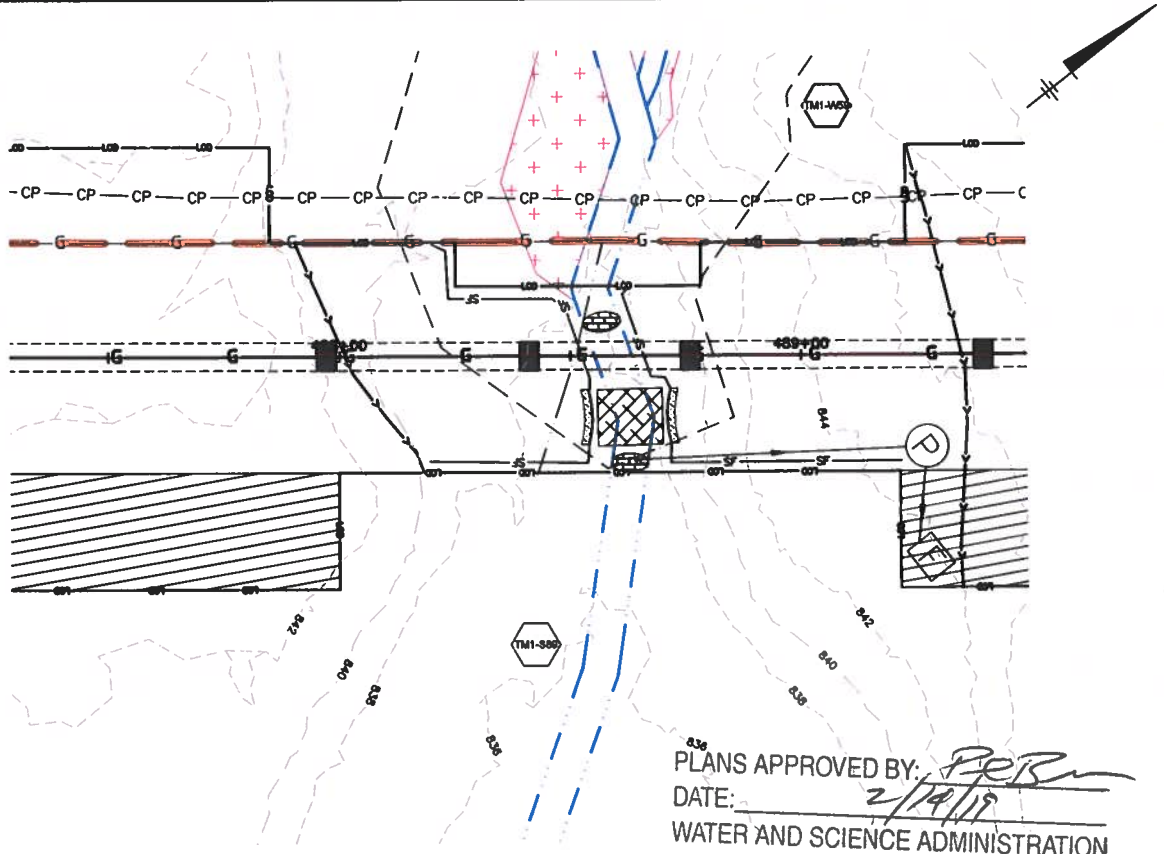
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-31B

User:OHUNTER Spec:AUS-NCSMOD File:G:\CADD\ACADDP\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-31B.DWG Scale:1:1 SavedDate:11/28/2018 Time:10:13 Plot Date: Hunter, Owen; 11/27/2018; 18:51 ; Layout:50

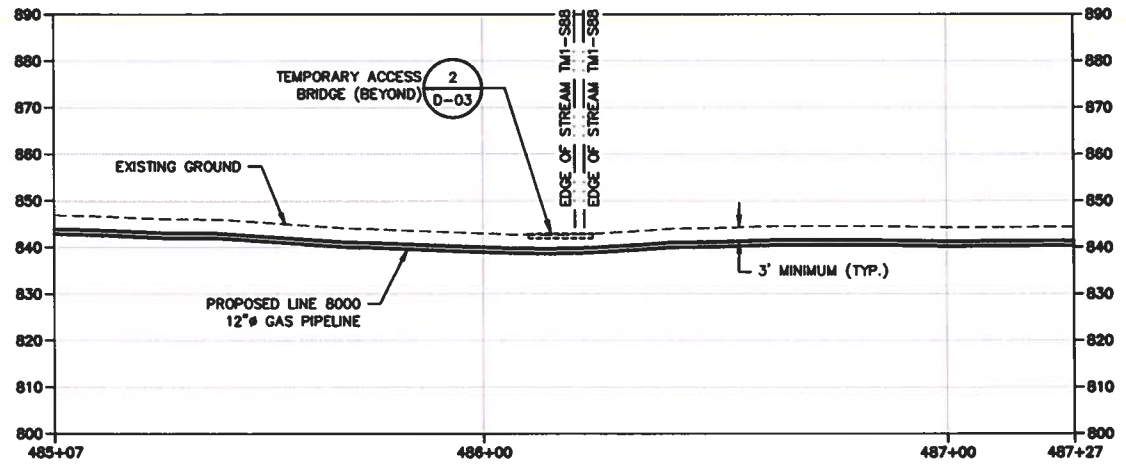


PLAN

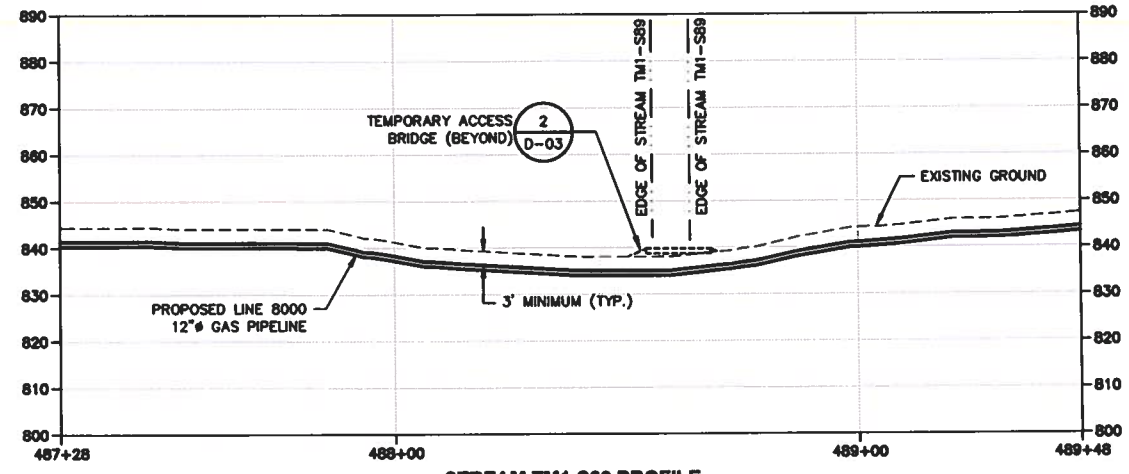


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S88 PROFILE



STREAM TM1-S89 PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W59 (new pipe installation)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	N/A	116
TM1-SS8	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-S89 (new pipe installation)	R3	8	33	264	N/A	N/A	N/A	N/A	1,200	N/A	N/A	N/A
TM1-W58 (new pipe installation)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	122	N/A	2,844
TM1-W58 (HDD pullback)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	108	N/A	2,522

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-ECT
CGTL8000-SCT
IMAGES:
HEXAGON KEYNOTES

User:OHUNTER Spec:AUS-NCSMOD File:G:\CADDACAD\PRO\JCGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-31C.DWG Scale:1:1 SavedDate:11/28/2018 Time:10:47 Plot Date: Hunter, Owen: 11/27/2018; 19:09 ; Layout:51

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

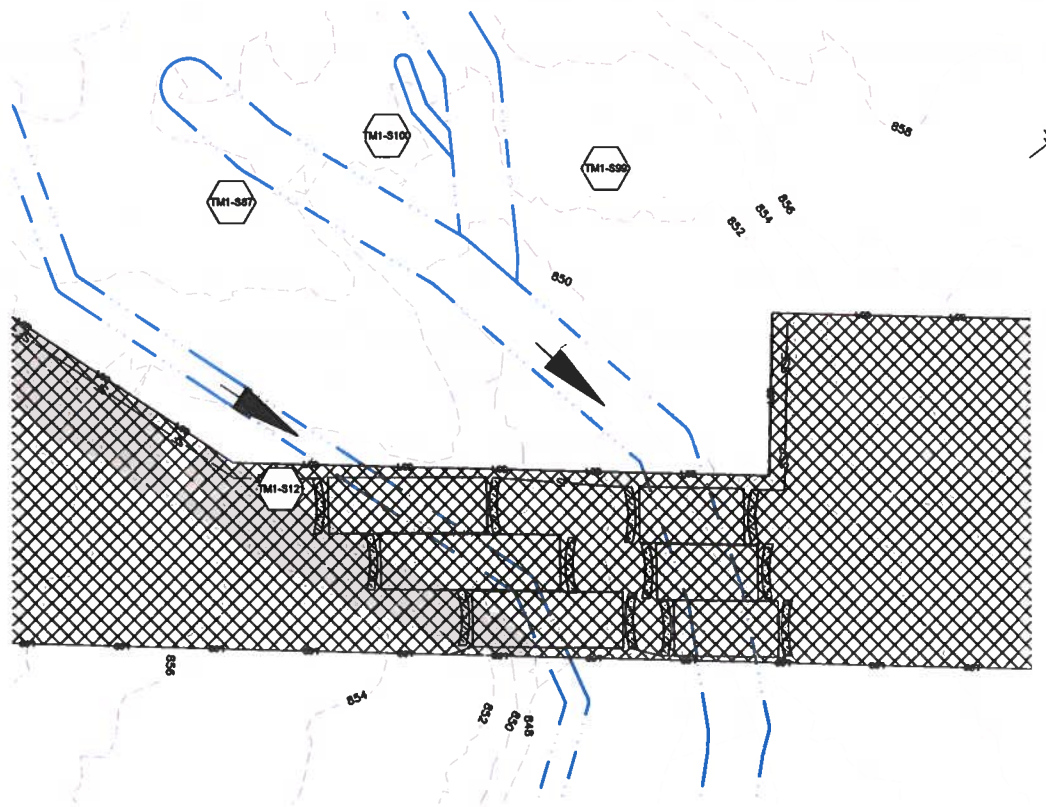
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S88 AND TM1-S89 CROSSINGS

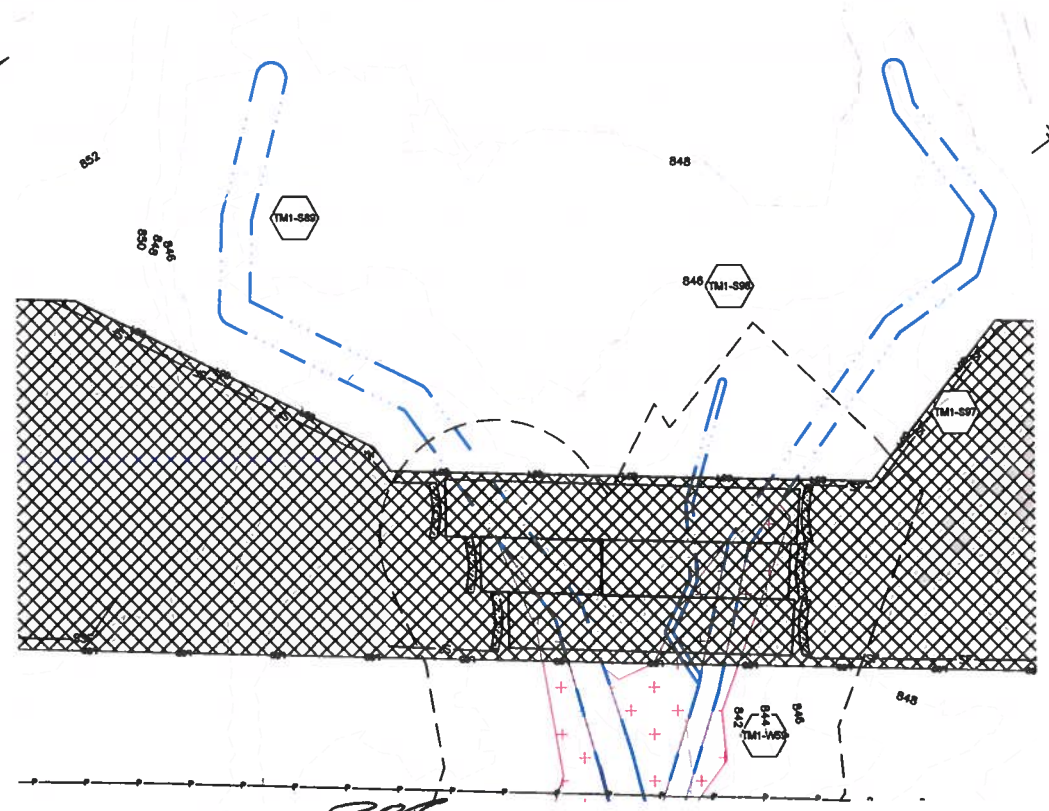
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-31C

51 OF 94

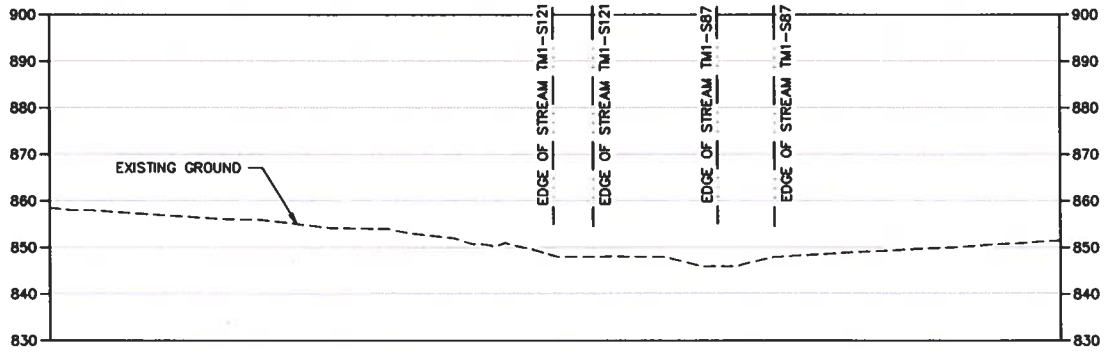


PLAN

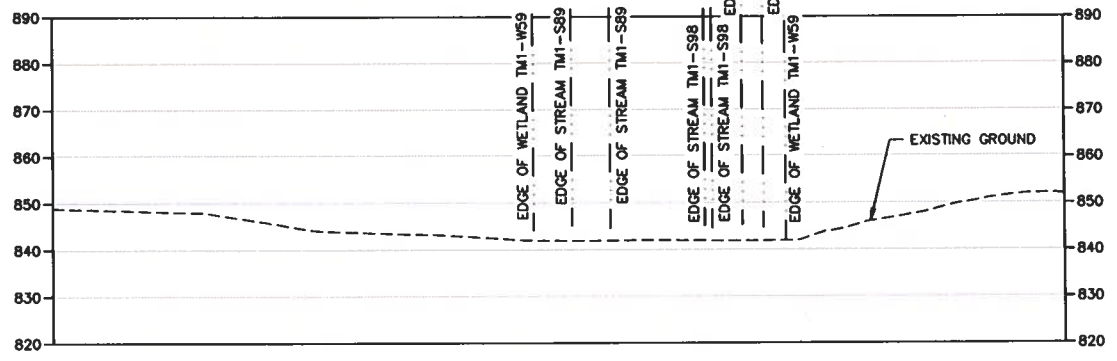


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S121 AND TM1-S87 PROFILE



TM1-S89, TM1-S98, TM1-W59, AND TM1-S97 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W59 (HDD pullback)	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	407	N/A	5,660
TM1-S89 (HDD pullback)	R3	0	0	0	N/A	N/A	N/A	N/A	1,134	N/A	N/A	N/A
TM1-S97	R3	0	0	0	N/A	N/A	N/A	N/A	940	N/A	N/A	N/A
TM1-S98	R4	0	0	0	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-S121 (HDD pullback)	R4	0	0	0	N/A	N/A	N/A	N/A	390	N/A	N/A	N/A
TM1-S87 (HDD pullback)	R3	0	0	0	N/A	N/A	N/A	N/A	924	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P → F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-24x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

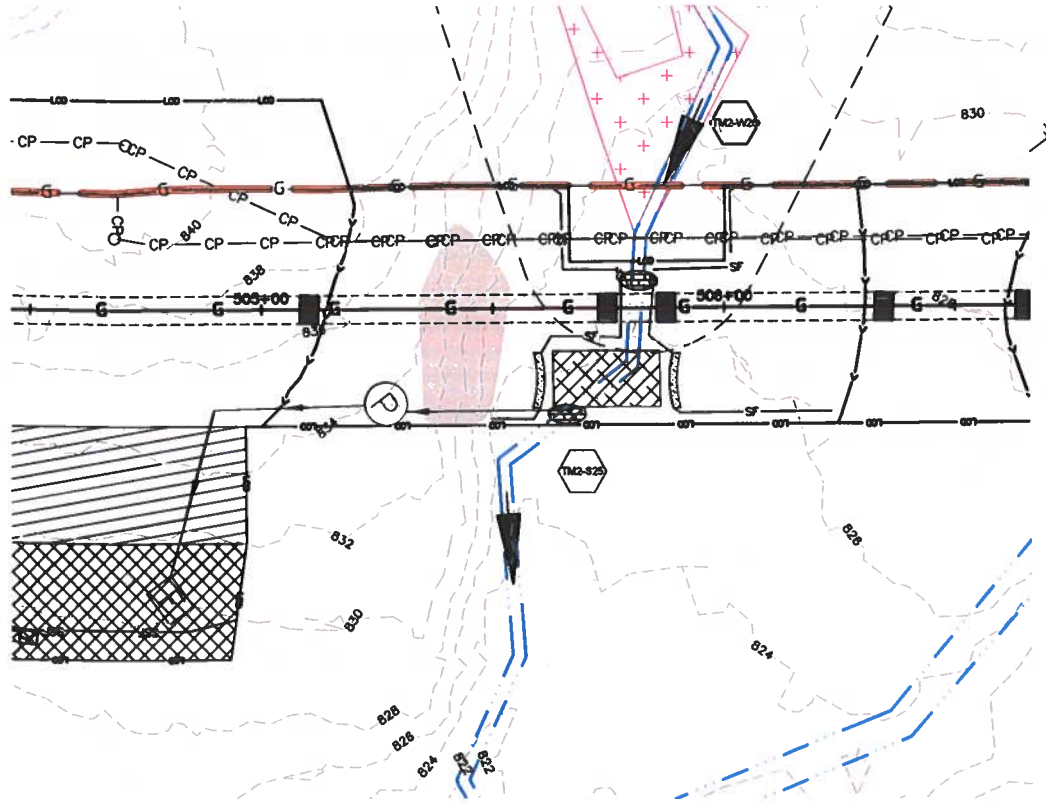
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S121, TM1-S87, TM1-S89, TM1-S98, TM1-W59, AND TM1-S97 CROSSINGS

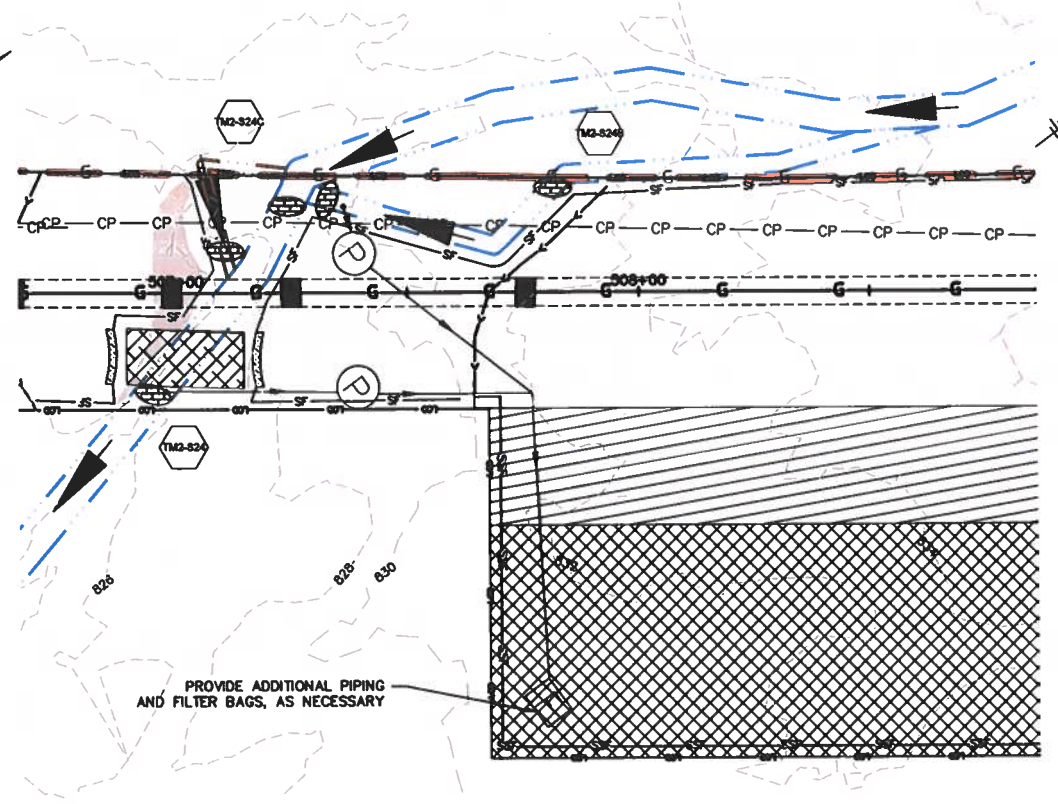
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-31D

User:OHUNTER Spec:AUS-NCSMOD File:G:\CADDACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-31D.DWG Scale:1:1 SavedDate:11/28/2018 Time:11:22 Plot Date: Hunter, Owen, 11/27/2018, 12:59 ; Layout:52

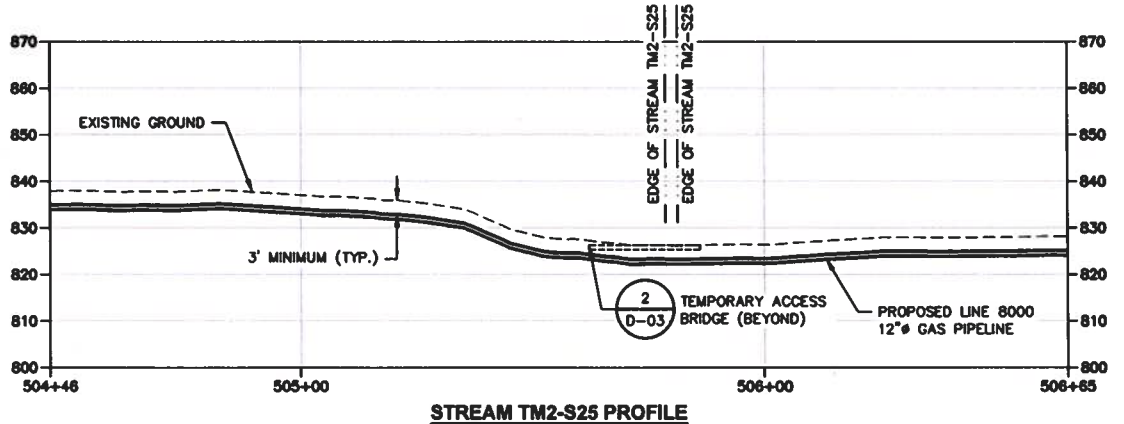


PLAN

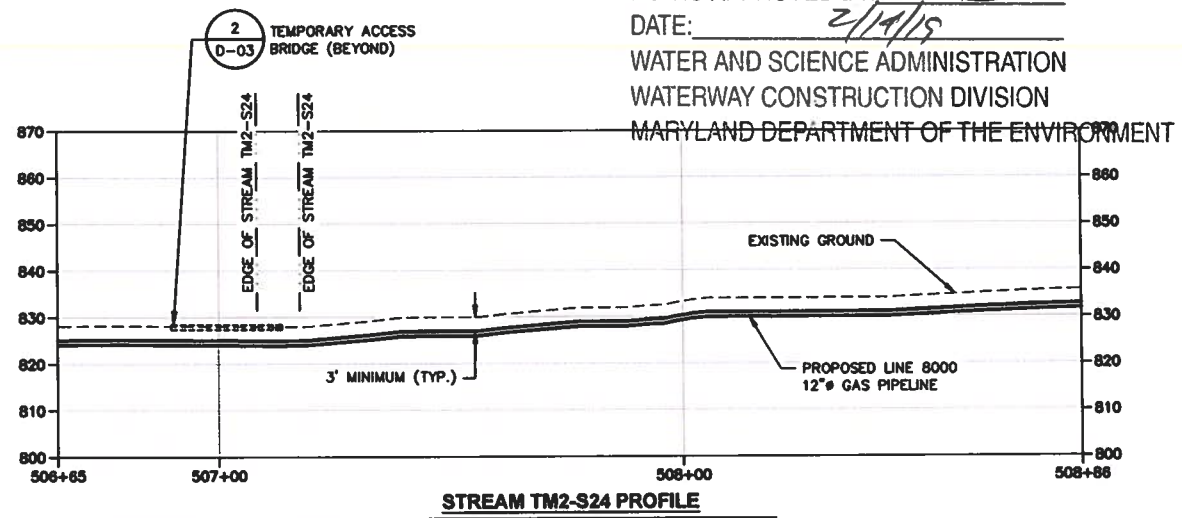


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S25 PROFILE



STREAM TM2-S24 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S24	R3	10	51	520	N/A	N/A	N/A	N/A	1080	N/A	N/A	N/A
TM2-S24B	R4	4	57	228	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-S24C	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM2-S25	R4	3	43	129	N/A	N/A	N/A	N/A	516	N/A	N/A	N/A
TM2-W26	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,174

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-SCC
CGTL8000-SCT
CGTL8000-PL
HEXAGON KEYNOTES

IMAGES:

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS			
Professional Engineer's No.: MD 52652			
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD	
Designed by: BES	Drawn by: BJJ	Checked by: MBH	

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

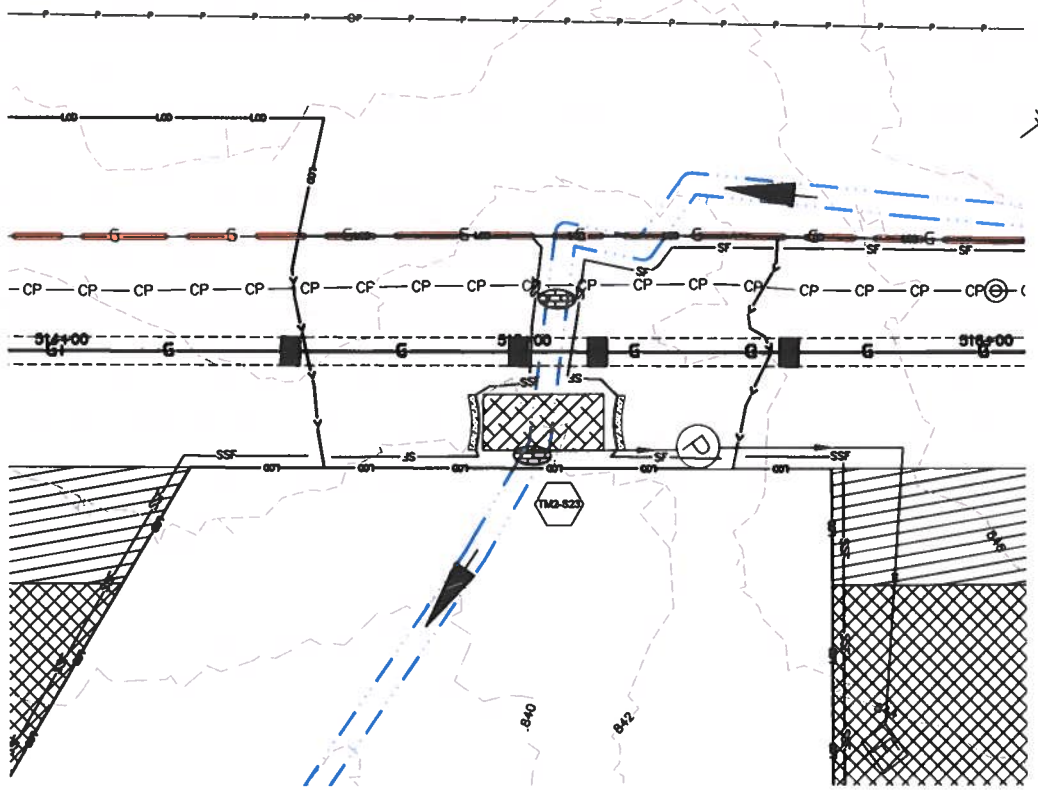
TM2-S25, TM2-W26, TM2-S24B, TM2-S24C AND TM2-S24 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

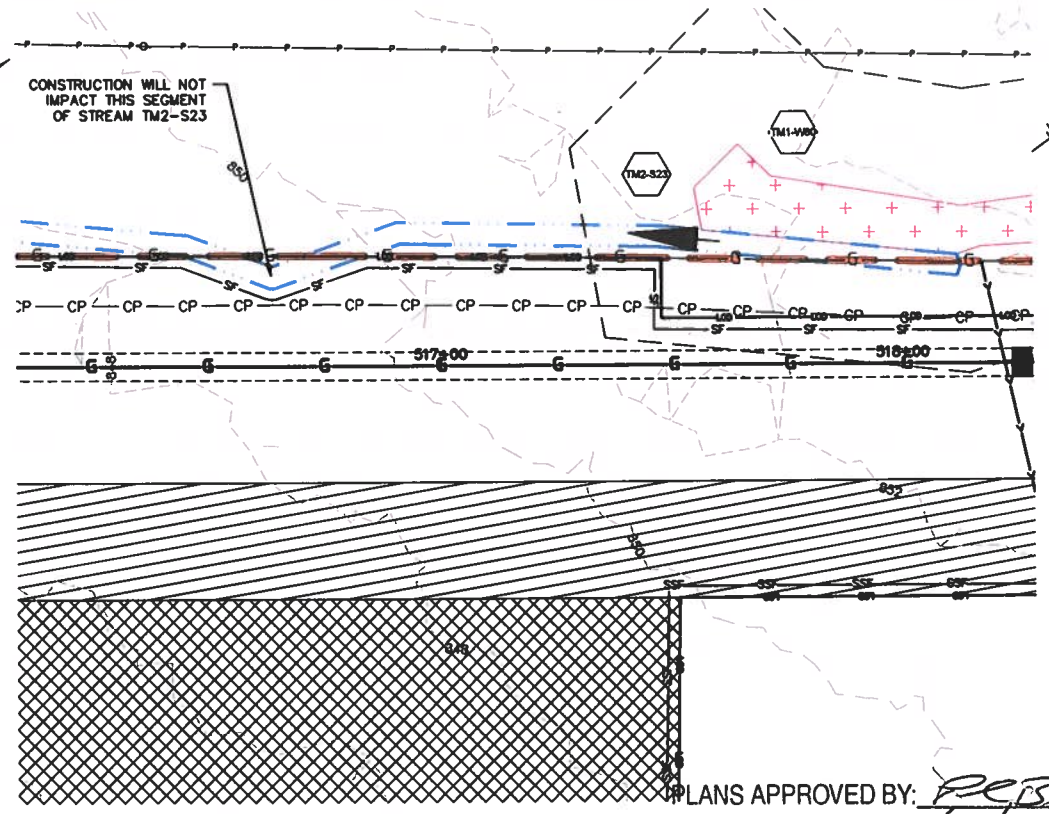
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 800
BUFFALO, NY 14202
Tel. 315.671.9545

X-32

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-32.DWG Scale:1:1 SavedDate:7/31/2018 Time:15:08 Plot Date: Steele, Sam; 11/26/2018; 12:10 ; Layout53

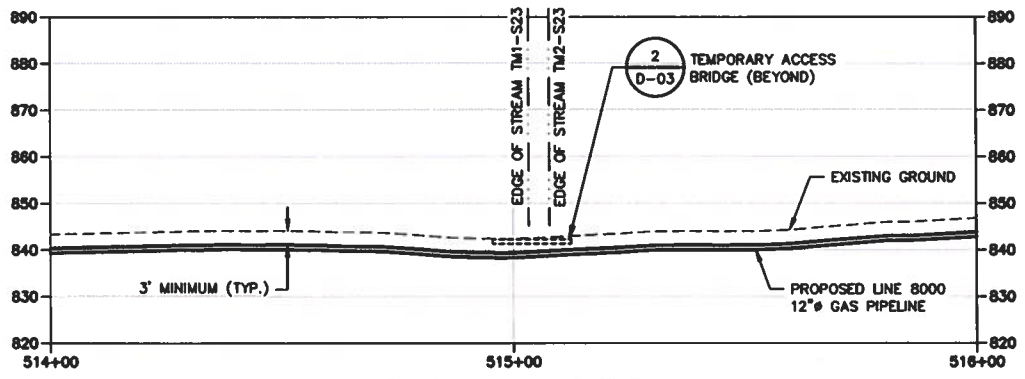


PLAN

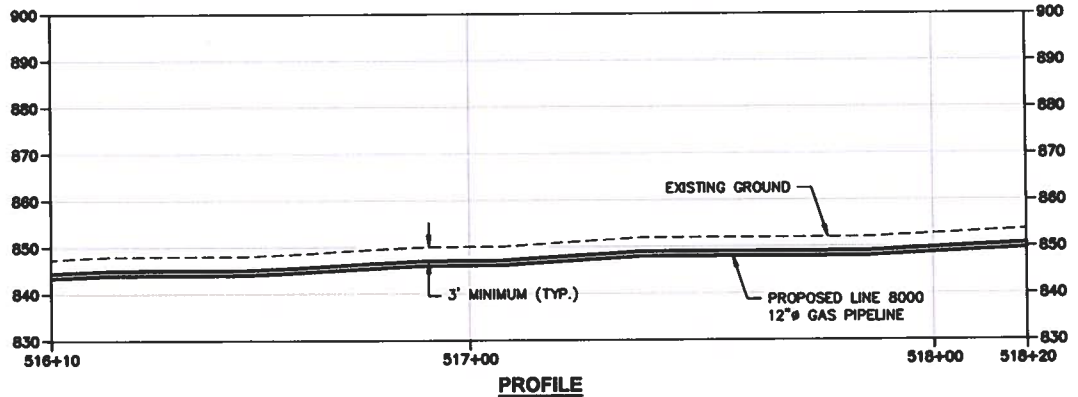


PLAN

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S23 PROFILE



PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S23	R4	12	35	768	N/A	N/A	N/A	N/A	1184	N/A	N/A	N/A
TM1-W80	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	269	N/A	19,315

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSECT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

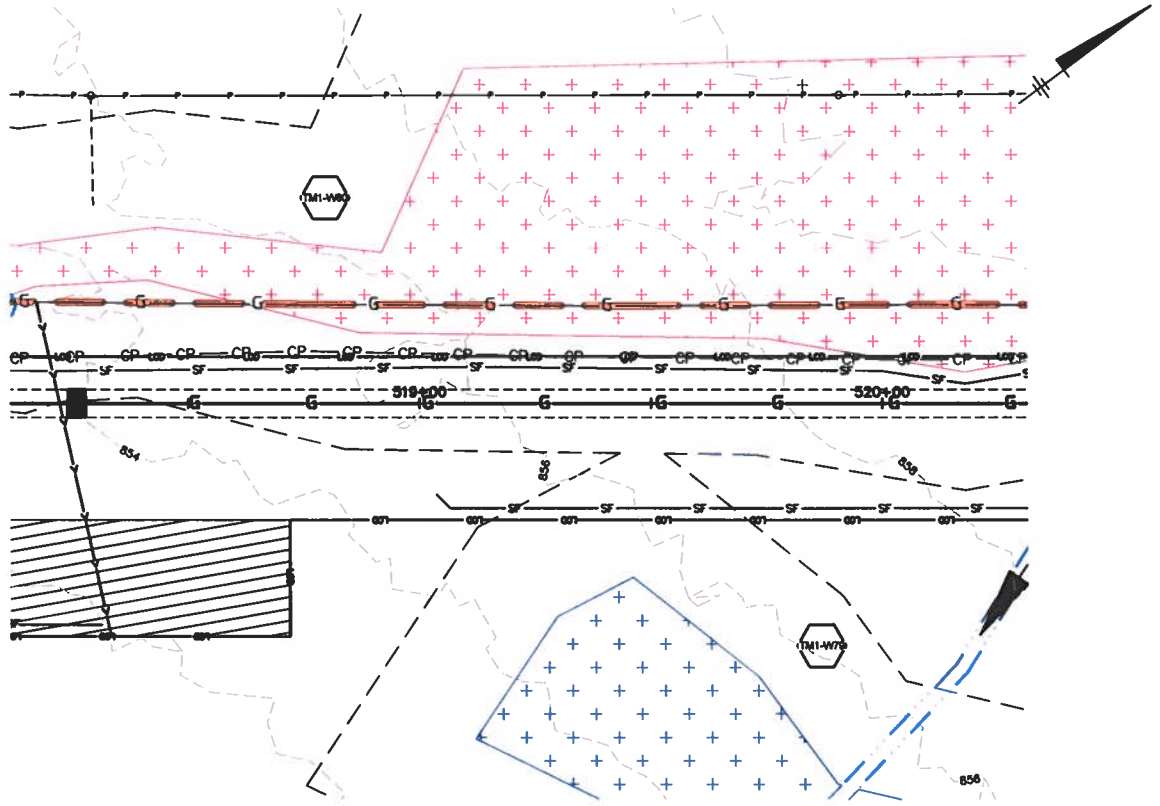
TM2-S23 CROSSING

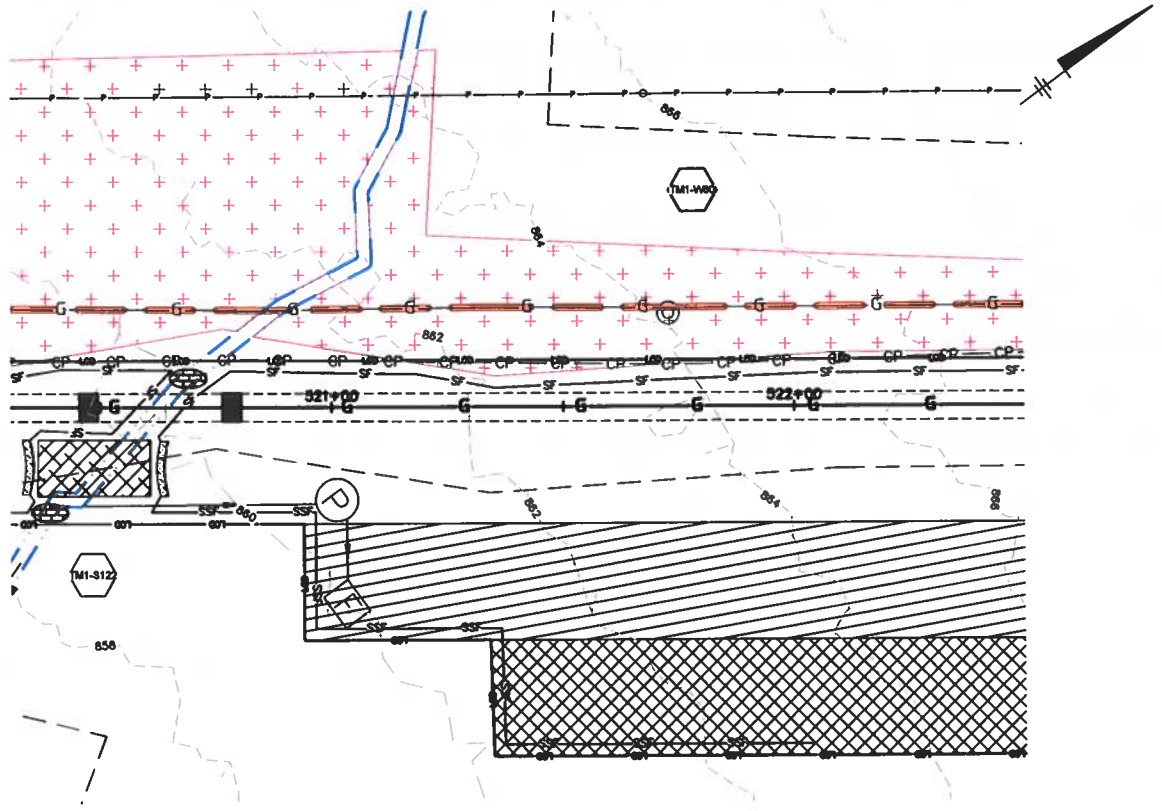
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-33

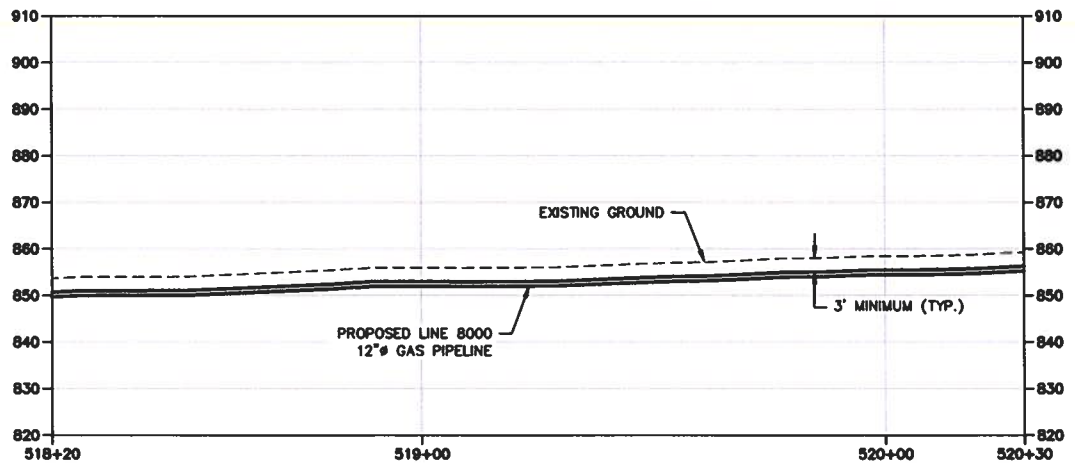
54 OF 94

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADDACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-33.DWG Scale:1:1 Saved/Date:7/31/2018 Time:15:33 Plot Date: Steele, Sam: 11/26/2018; 11:51 ; Layout:54

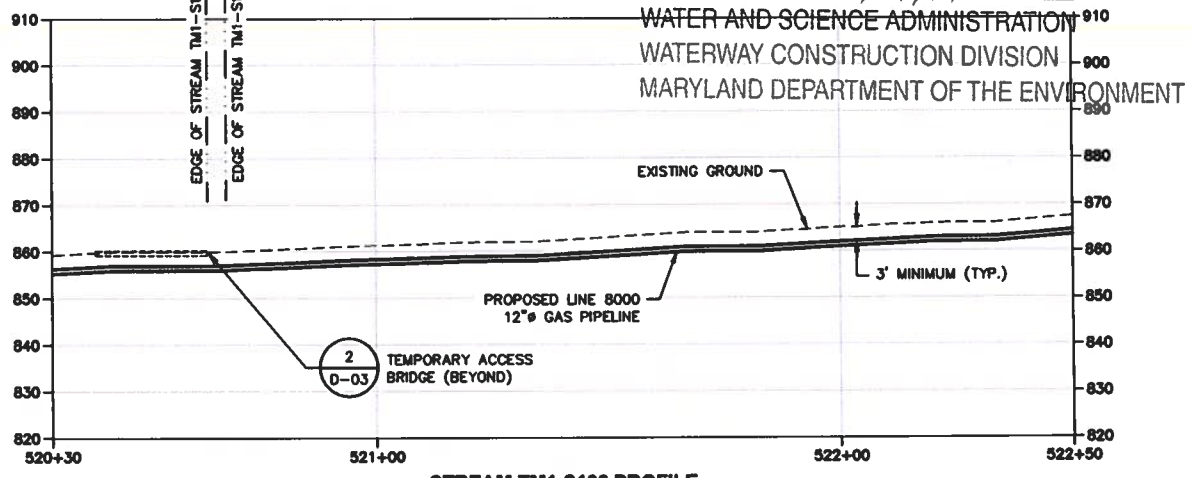




PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



STREAM TM1-S122 PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W80	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	269	N/A	19,315
TM1-S122	R4	3	35	105	N/A	N/A	N/A	N/A	595	N/A	N/A	N/A
TM1-W79	PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	432

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-FL
CGTL8000-SC
CGTL8000-XCT
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

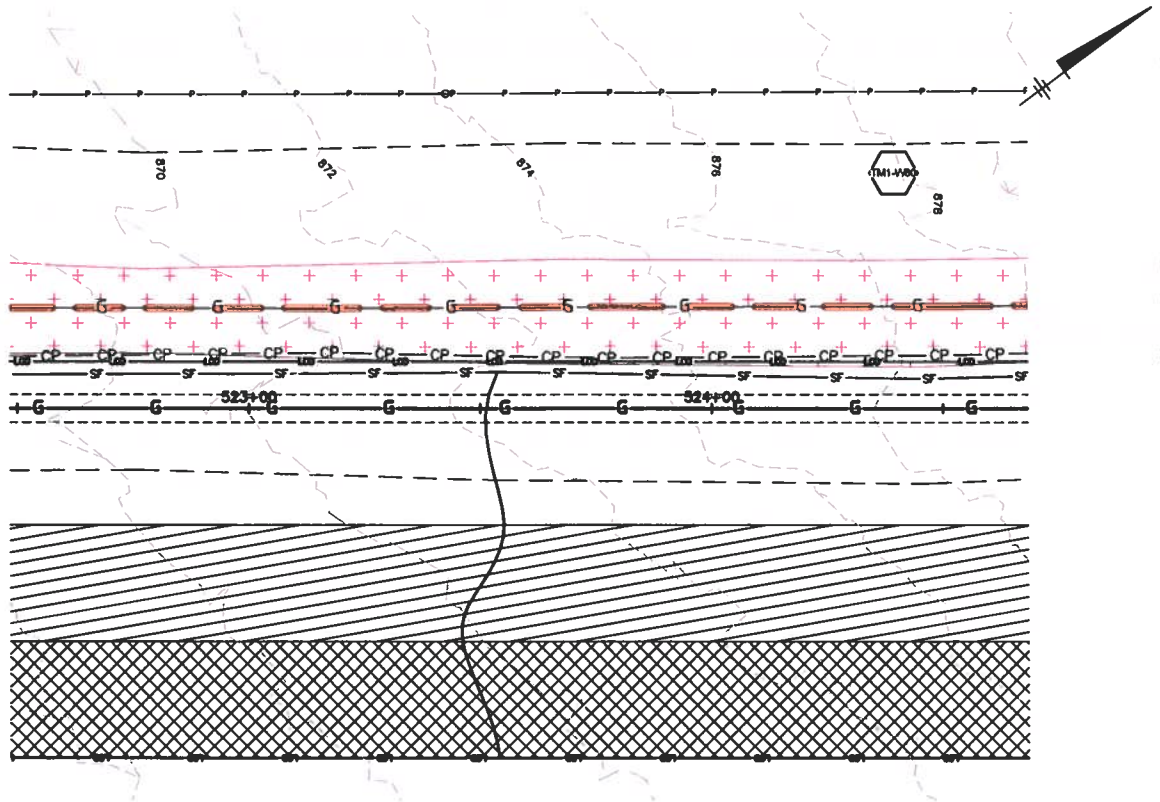
TM1-S122 CROSSING

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

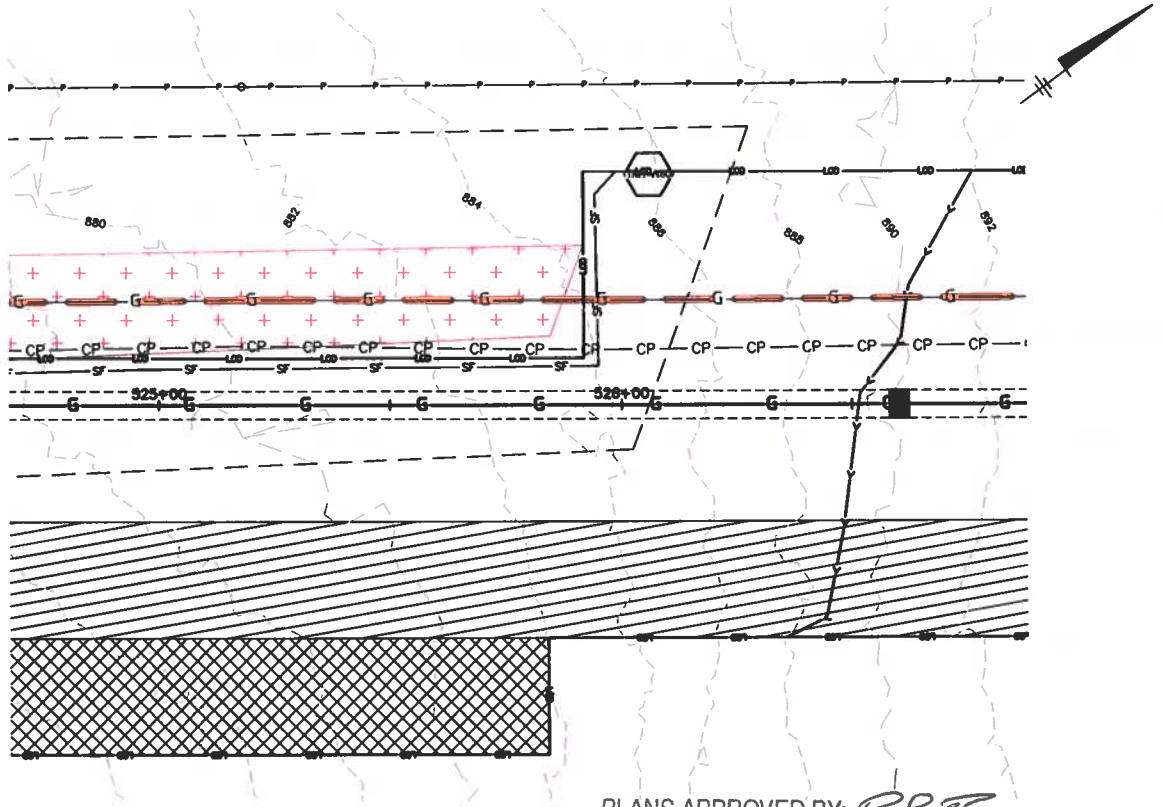
X-33A

55 OF 94

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PRO\CGTL8000.0001 - LINE 8000\SHEETS\CROSSING\GSVX-33A.DWG Scale:1:1 SavedDate:7/31/2018 Time:16:16 Plot Date: Steele, Sam: 11/28/2016, 10:27 : Layout:55

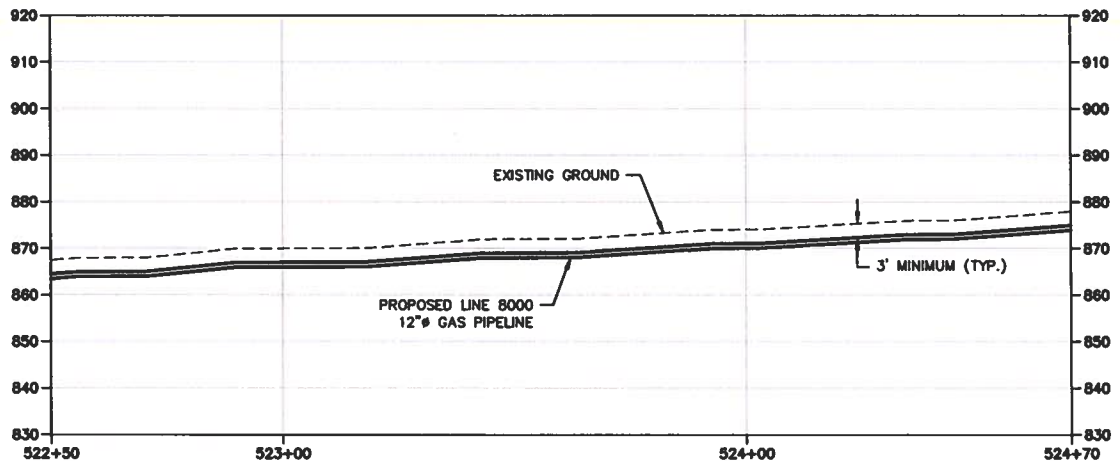


PLAN

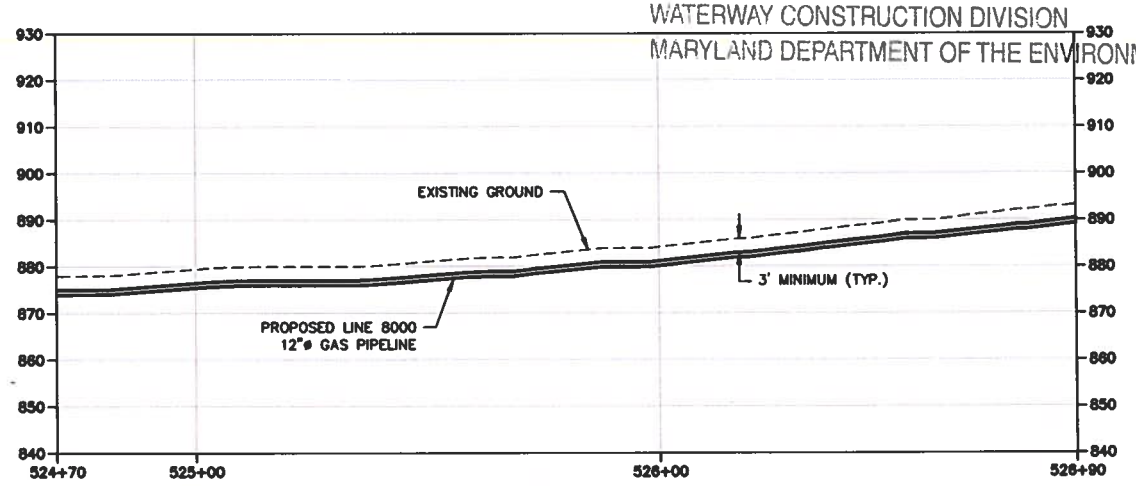


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



PROFILE-

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W80	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	269	N/A	19,315

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-05. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PSC
CGTL8000-TM1
CGTL8000-KCT
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

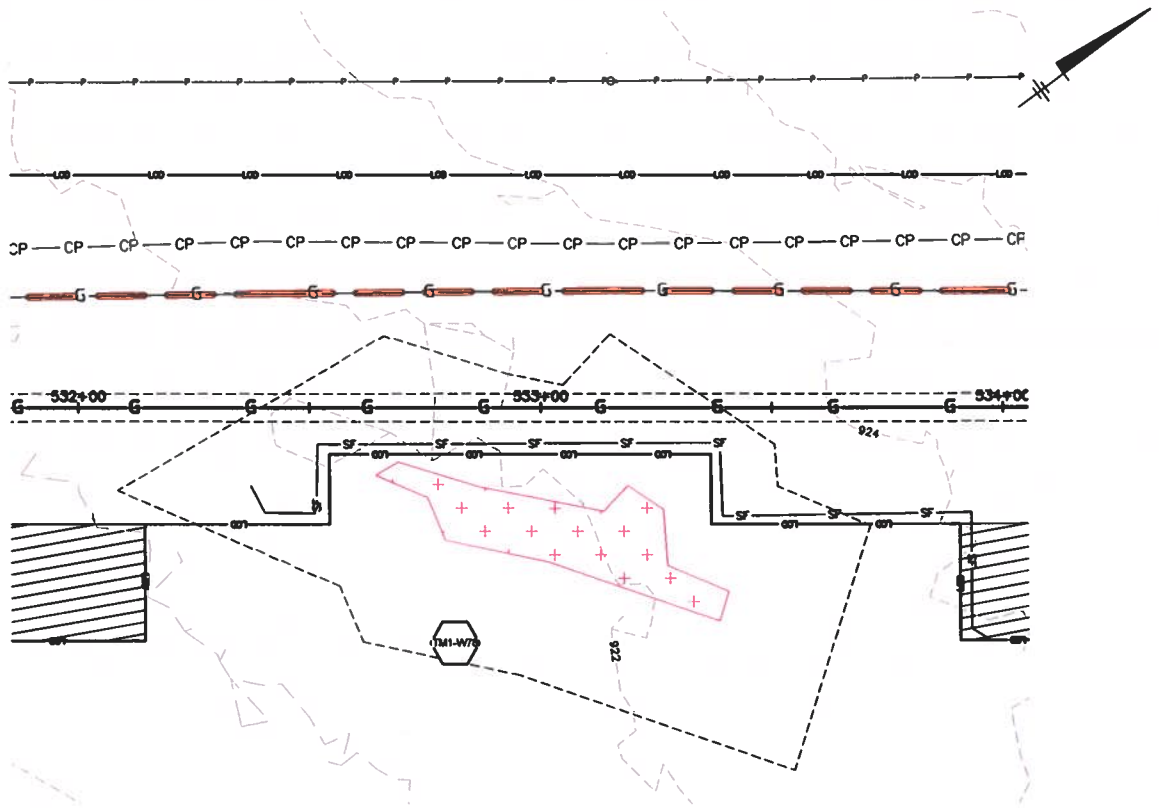
TM1-W80 CROSSING

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018

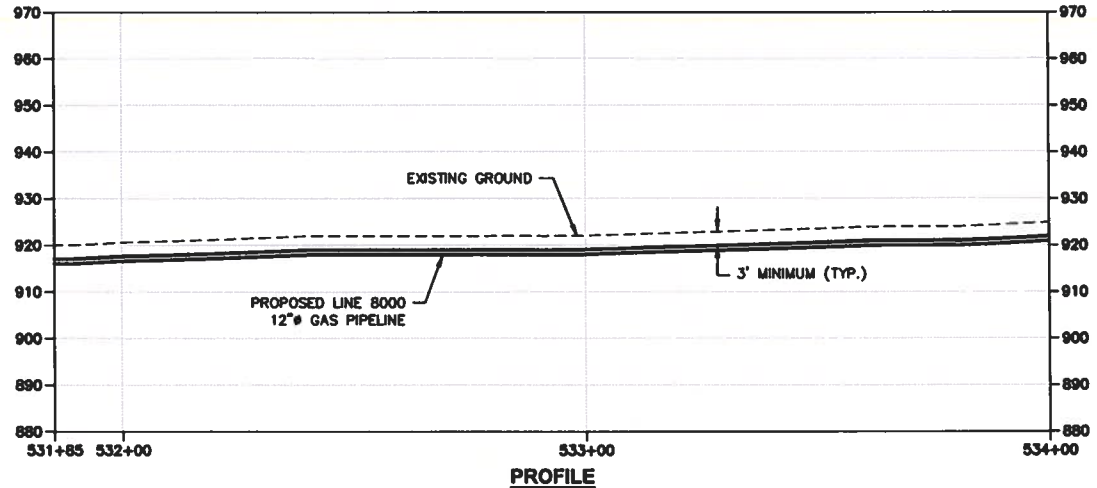
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-33B

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADDVACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-33B.DWG Scale:1:1 SavedDate:7/31/2018 Time:16:50 Plot Date: Steele, Sam: 11/20/2018; 10:08 ; Layout:56



PLAN



PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W78	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	2,259

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-SSC
CGTL8000-XSCT
HEXAGON KEYNOTES

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADDACAD\PRO.JC\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-33C.DWG Scale:1:1 SavedDate:7/31/2018 Time:17:03 Plot Date: Steele, Sam: 11/28/2018; 08:48 ; Layout:57

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

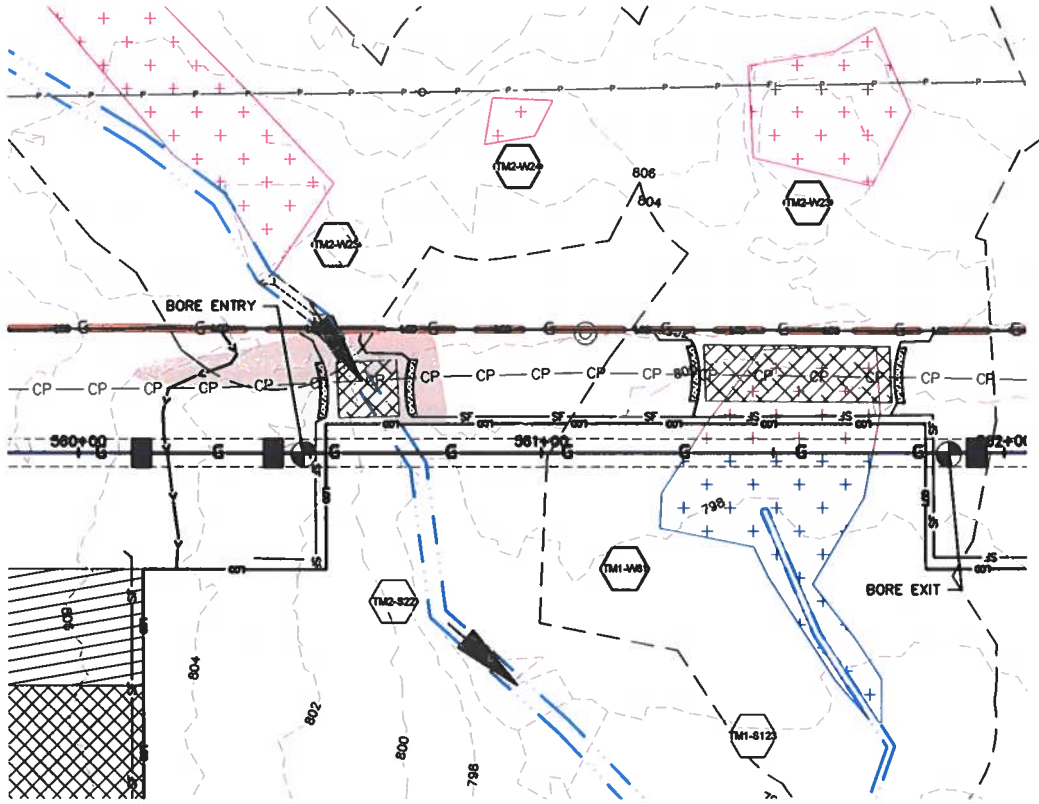
TM1-W78 CROSSING

ARCADIS Project No.
CGTL8000.0001

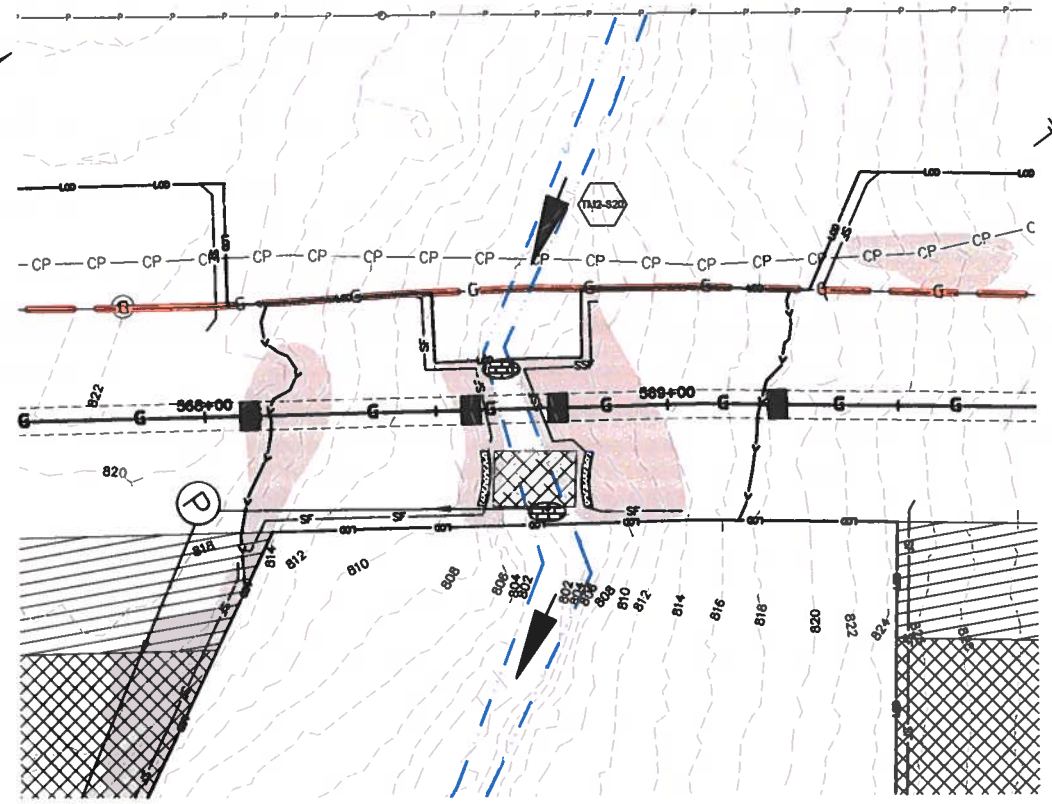
Date
NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

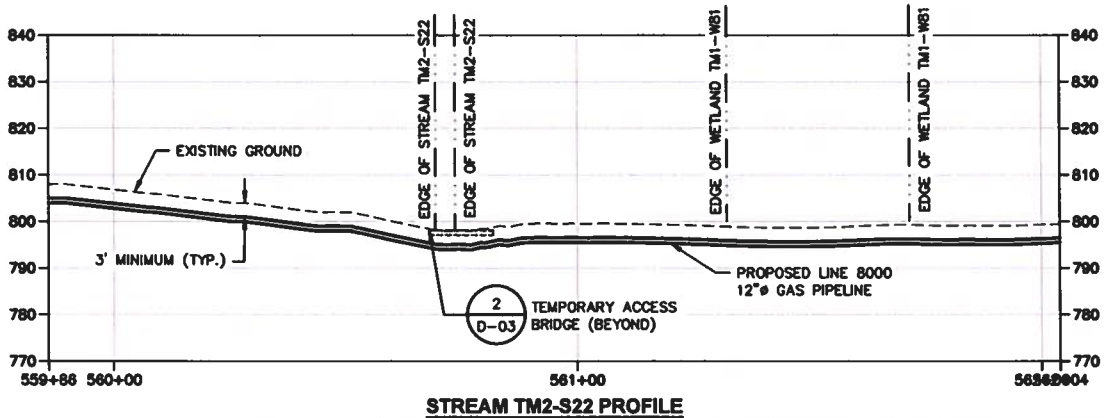
X-33C



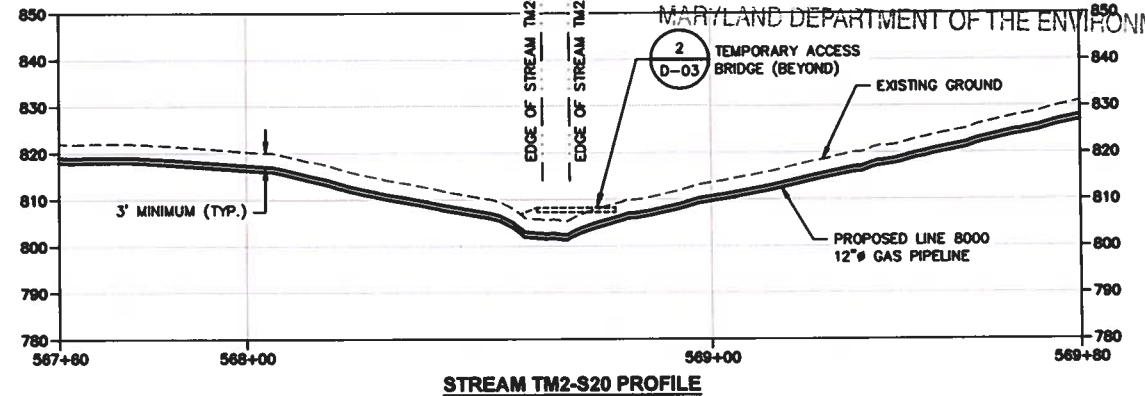
PLAN



PLAN



STREAM TM2-S22 PROFILE



STREAM TM2-S20 PROFILE

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE — 3 / D-01
- SSF — SUPER SILT FENCE — 4 / D-01
- 24" COMPOST FILTER SOCK — 1 / D-07
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION — 3 / D-03
- TEMPORARY GABION — 3 / D-06
- INTERCEPTOR DIVERSION — 1 / D-02
- TRENCH PLUG — 2 / D-02
- P — F PUMP AND FILTER BAG — 3 / D-02
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING — 2 / D-03, 1 / D-04
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) — 1 / D-01, 2 / D-01
- SOIL STABILIZATION MATTING — 1 / D-03
- WEIGHTED SEDIMENT FILTER TUBE — 2 / D-04
- BROAD-BASED DIP — 3 / D-04
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S20	R3	10	34	340	N/A	N/A	N/A	N/A	315	N/A	N/A	N/A
TM2-S22	R3	0	0	0	N/A	N/A	N/A	N/A	180	N/A	N/A	N/A
TM2-W25	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	418
TM1-W81	PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	508	N/A	1,574

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-3dx22
CGTL8000-LEGEND
CGTL8000-LEC
CGTL8000-PL
HEXAGON KEYNOTES
CGTL8000-XCT

IMAGES:

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52852 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

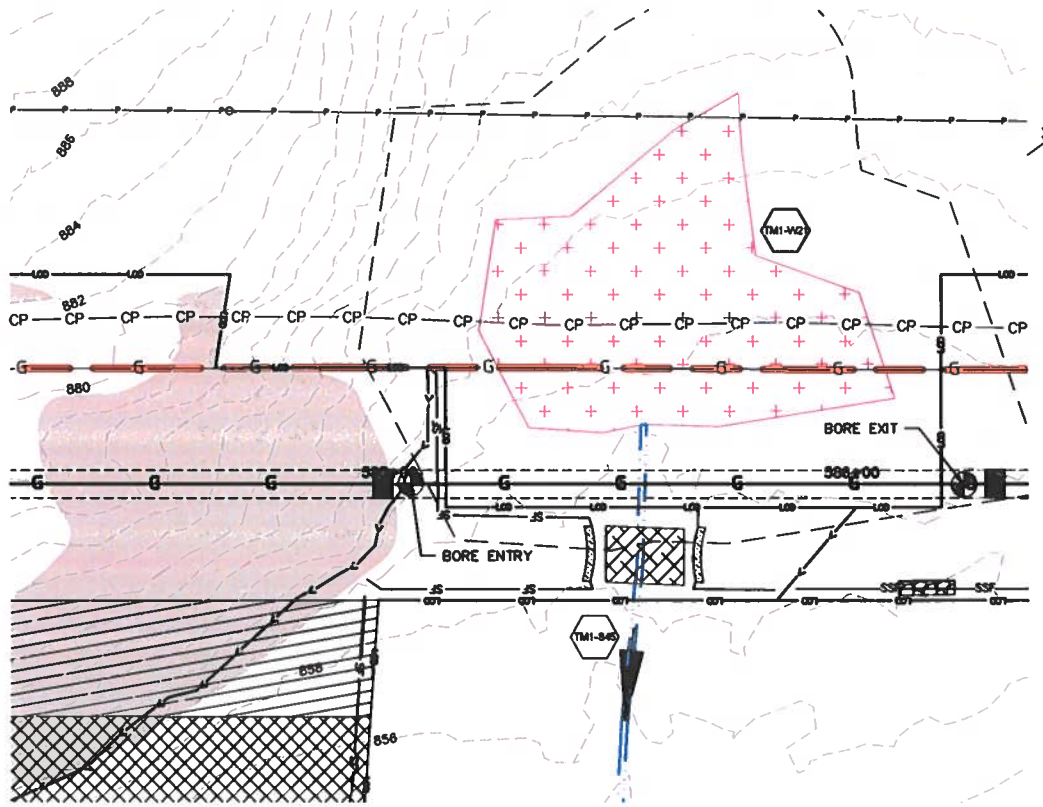
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM2-S22 AND TM2-S20 CROSSINGS

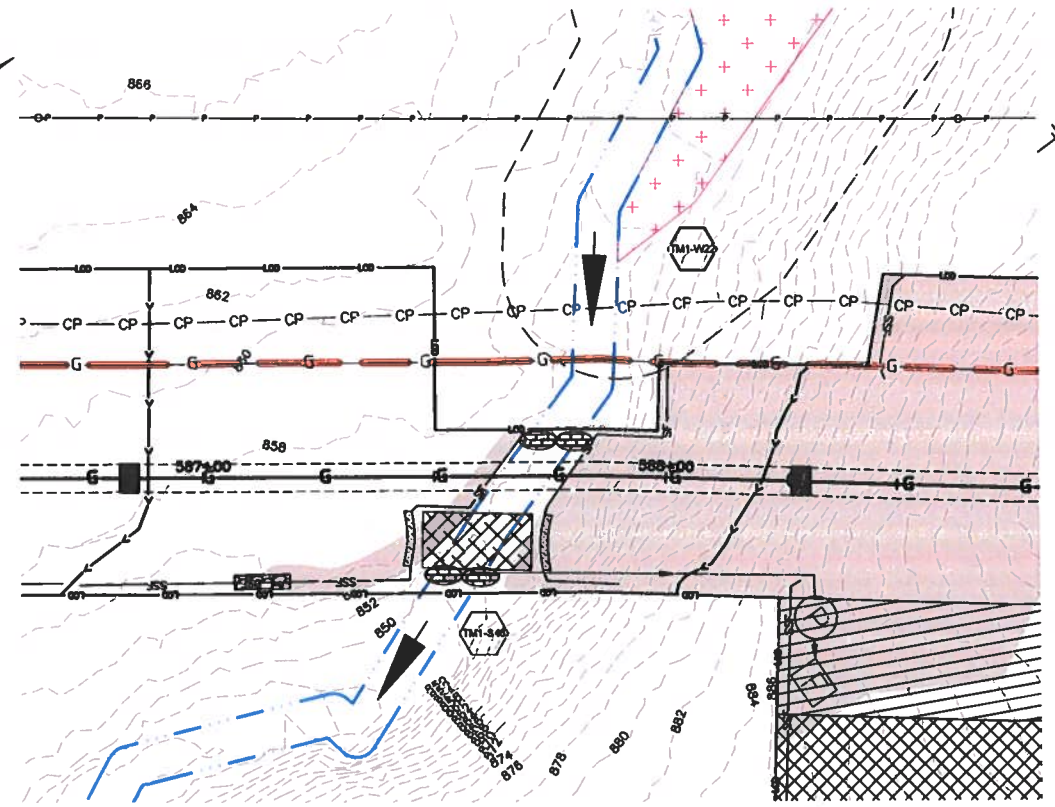
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-34

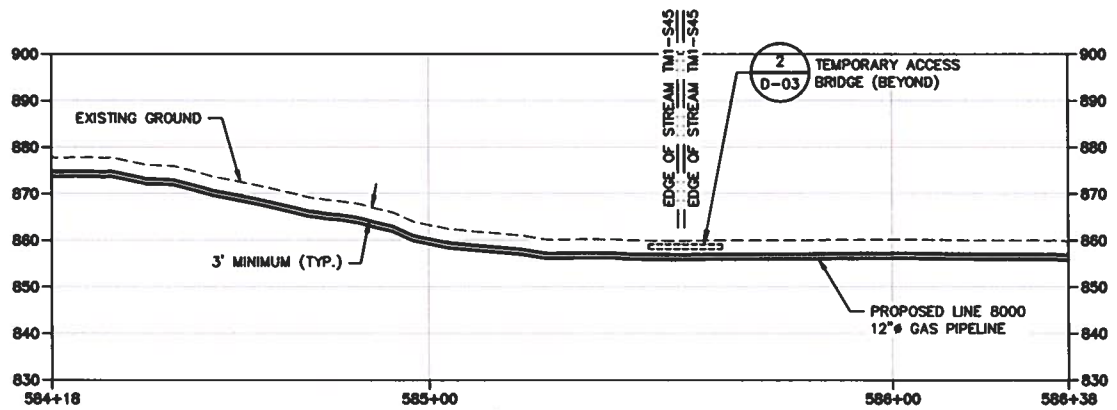


PLAN

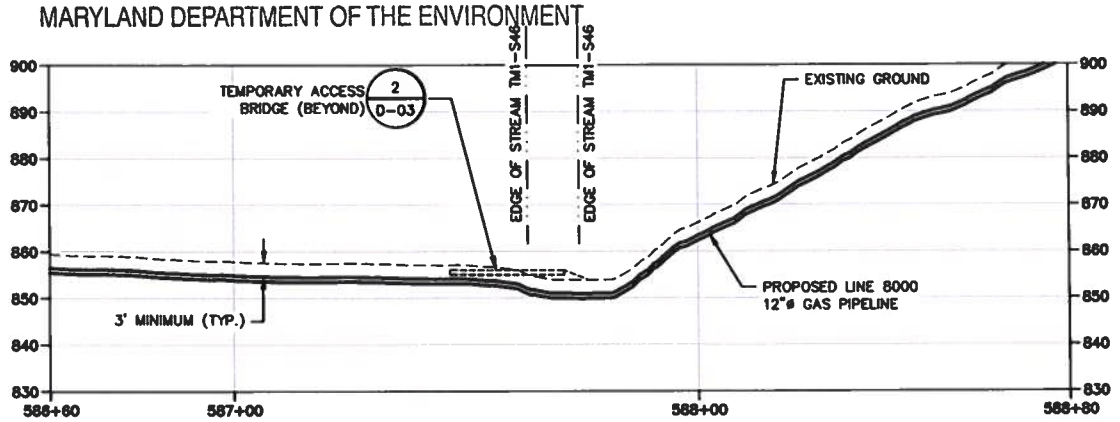


PLAN

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S45 PROFILE



STREAM TM1-S46 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S45	R4	0	0	0	N/A	N/A	N/A	N/A	120	N/A	N/A	N/A
TM1-S46	R3	9	37	333	N/A	N/A	N/A	N/A	120	N/A	N/A	N/A
TM1-W21	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	905
TM1-W22	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	3

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24" COMPOST FILTER SOCK (1 / D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F — PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03, 1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01, 2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-GENERAL NOTES
CGTL8000.XCT
CGTL8000-PL
IMAGES:

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S45 AND TM1-S46 CROSSINGS

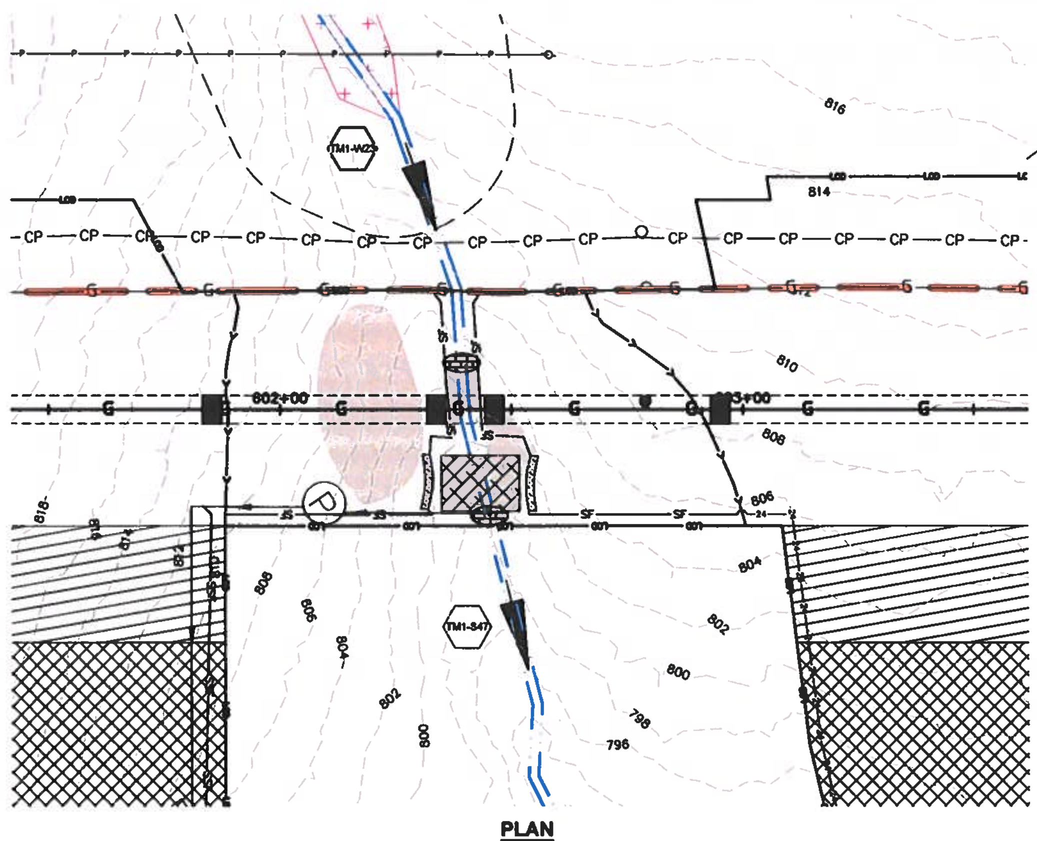
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

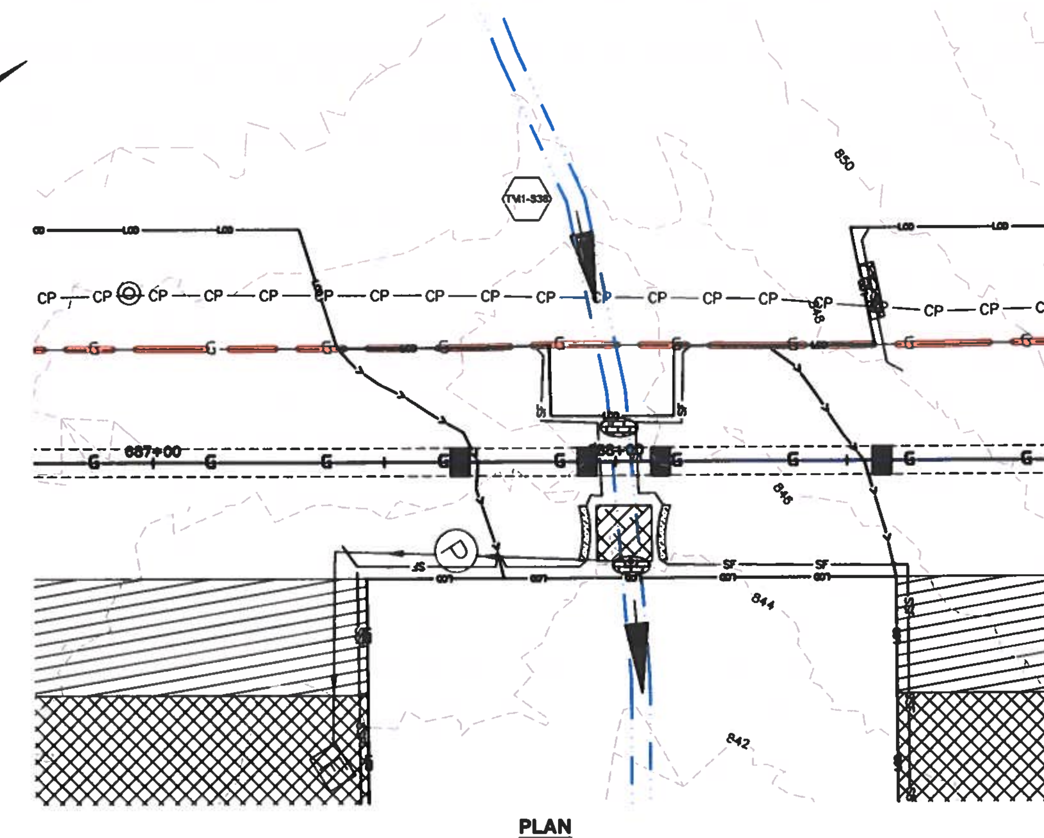
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-35

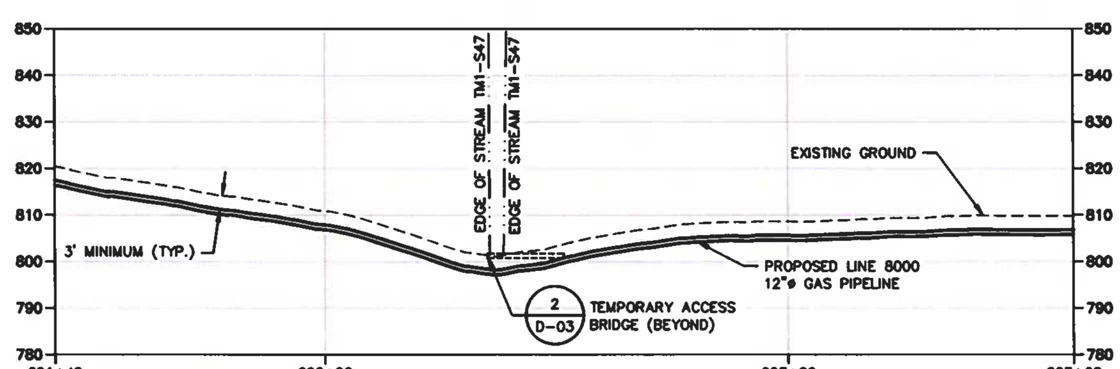
59 OF 94

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-36.DWG Scale:1:1 SavedDate:11/26/2018 Time:07:52 Plot Date: Steele, Sam; 11/26/2018; 08:51 ; Layout:60

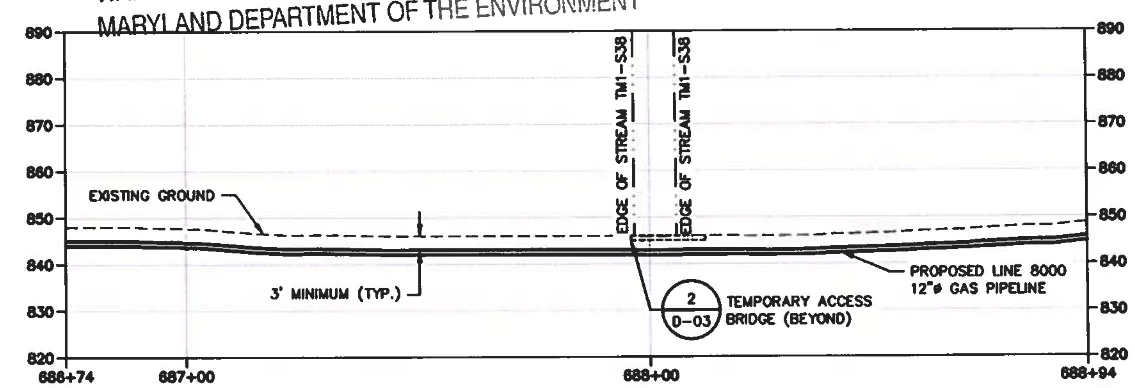




PLANS APPROVED BY:
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S47 PROFILE



STREAM TM1-S38 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S38	R4	4	32	128	N/A	N/A	N/A	N/A	320	N/A	N/A	N/A
TM1-S47	R4	2	35	70	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24 — 24" COMPOST FILTER SOCK (1 / D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03) (1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01) (2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-XCT, CGTL8000-PL, HEXAGON KEYNOTES
IMAGES:

1"=20' (scale bar: 20' 0 20' 40')
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852
State: MD | Date Signed: 11/26/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

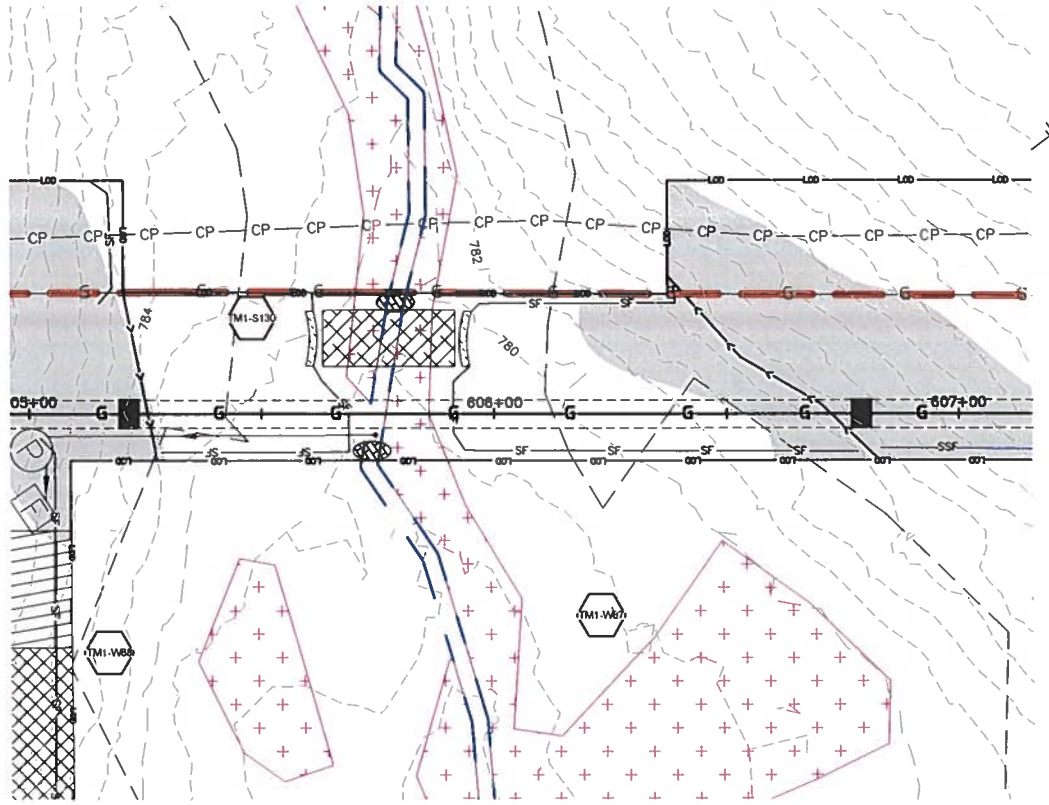
ARCADIS — Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

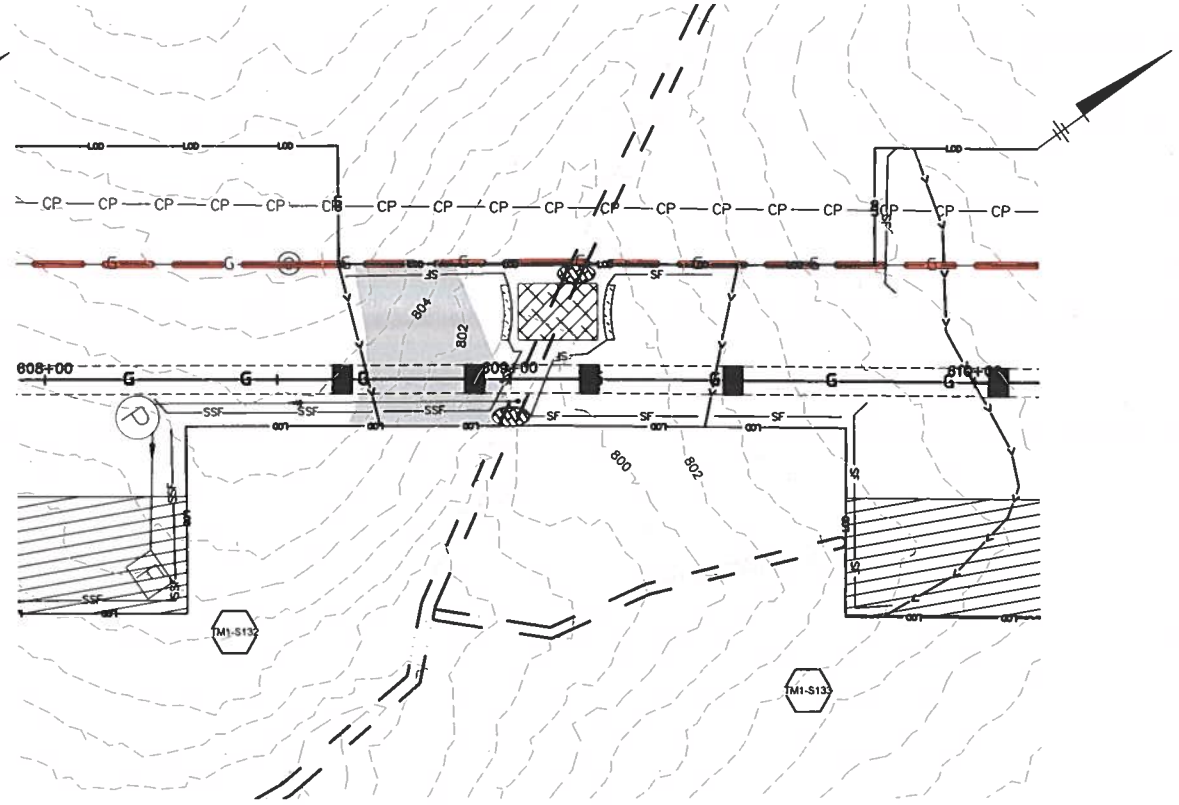
TM1-S47 AND TM1-S38 CROSSINGS

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-36

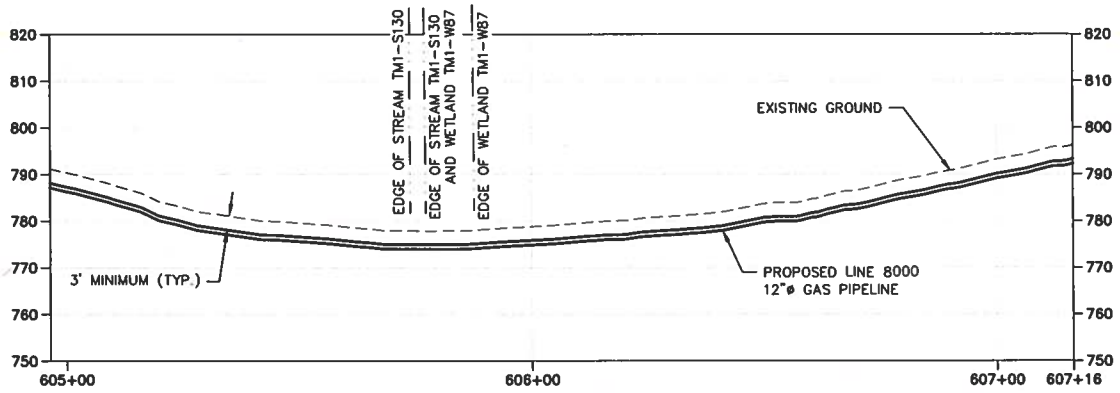


PLAN

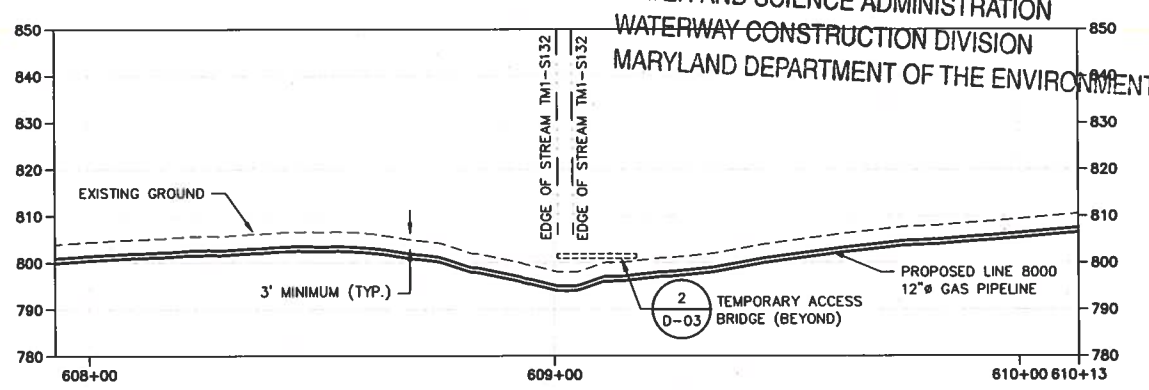


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S130 PROFILE



STREAM TM1-S132 PROFILE

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S130	R4	4	35	140	N/A	N/A	N/A	N/A	N/A	912	N/A	N/A	N/A
TM1-W87	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	451	N/A	1,864
TM1-W88	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	156
TM1-S132	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-PL, CGTL8000-XCT
IMAGES: HEXAGON KEYNOTES_20 Scale, HEXAGON KEYNOTES_60 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

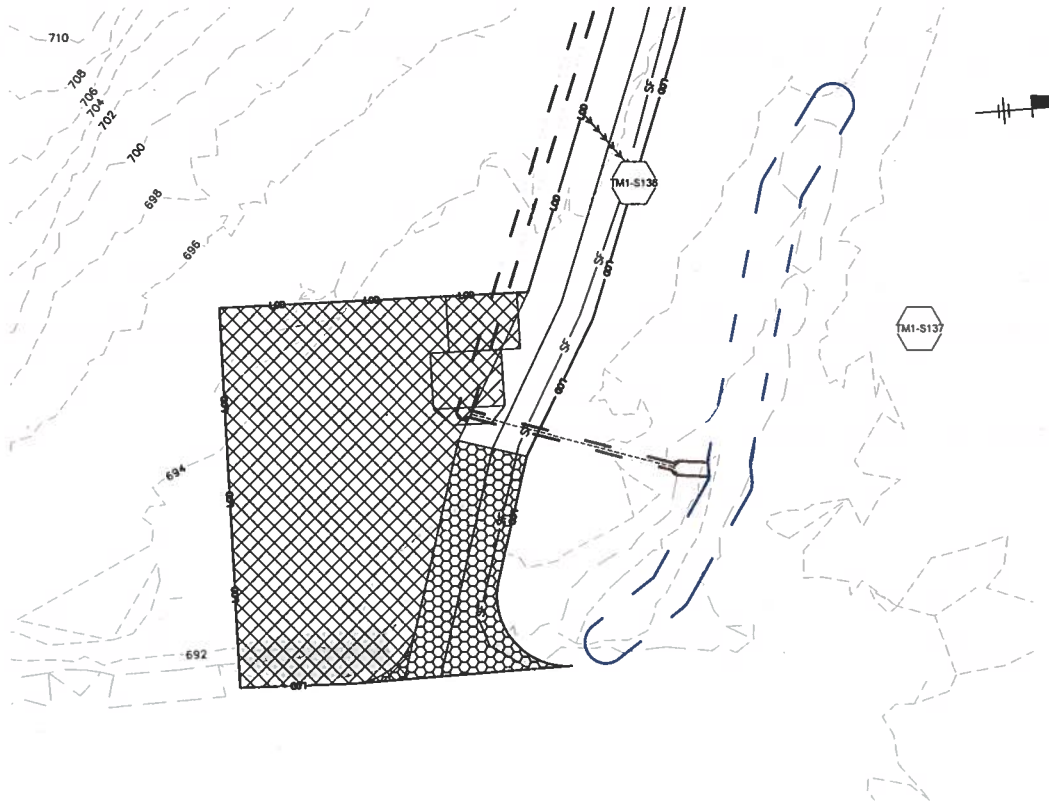
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S130, TM1-S132, AND TM1-W87 CROSSINGS

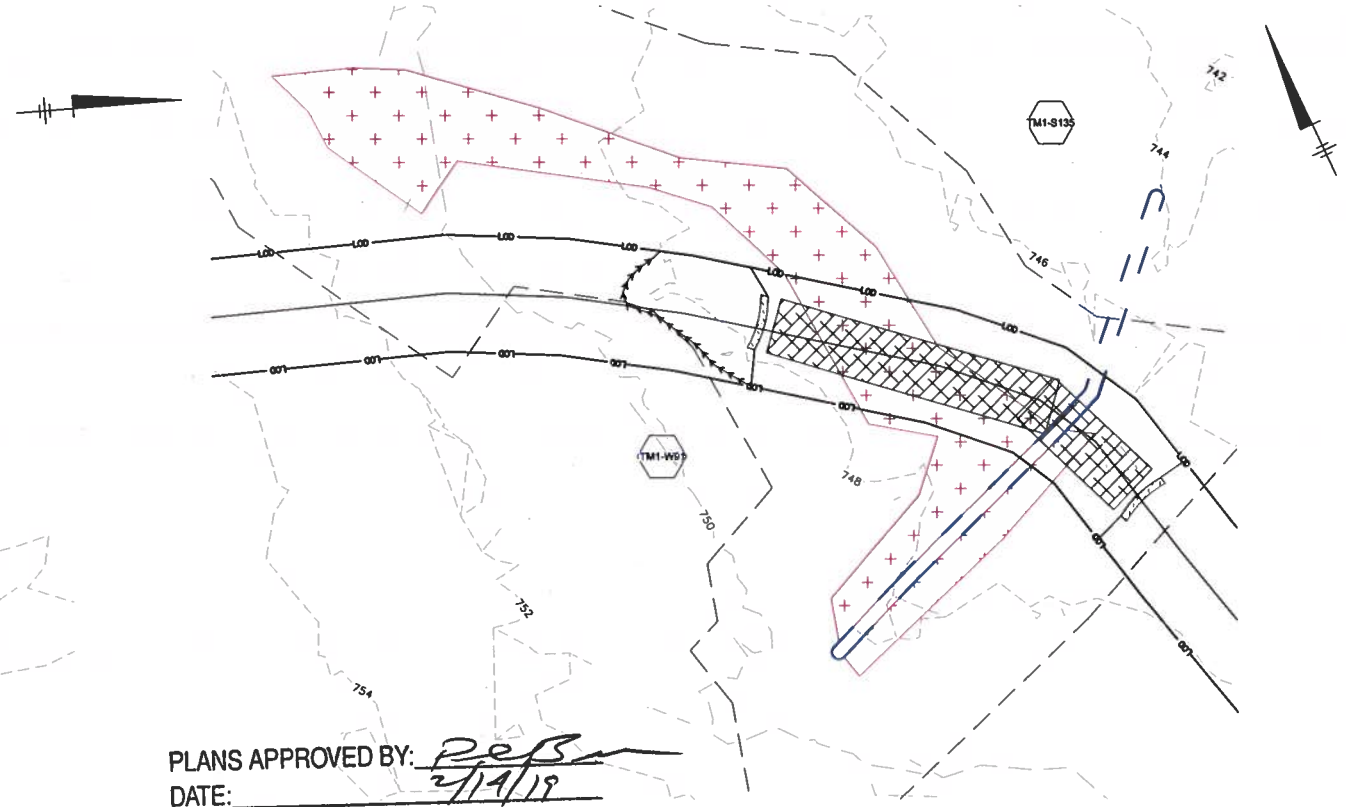
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-36A

User:OHUNTER Spec:AUS-NCSMOD File:G:\CAD\DACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-36A.DWG Scale:1:1 SaveDate:12/11/2018 PlotDate:12/11/2018 Time:14:39 Plot Date: Hunter, Owen: 12/11/2018; 16:23 ; Layout:61

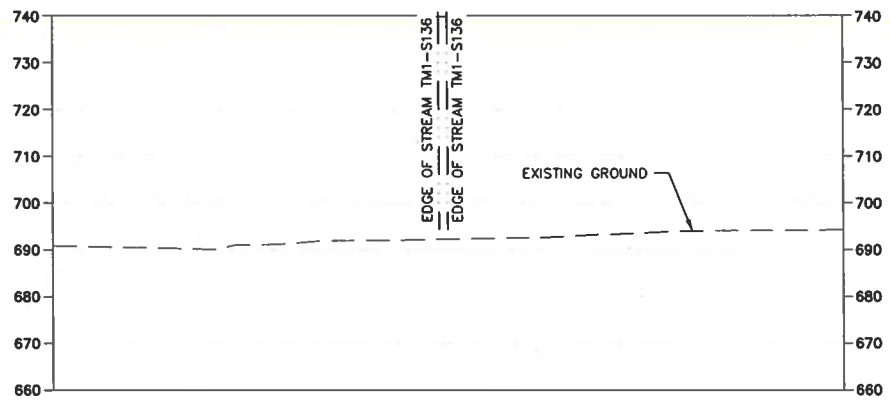


PLAN

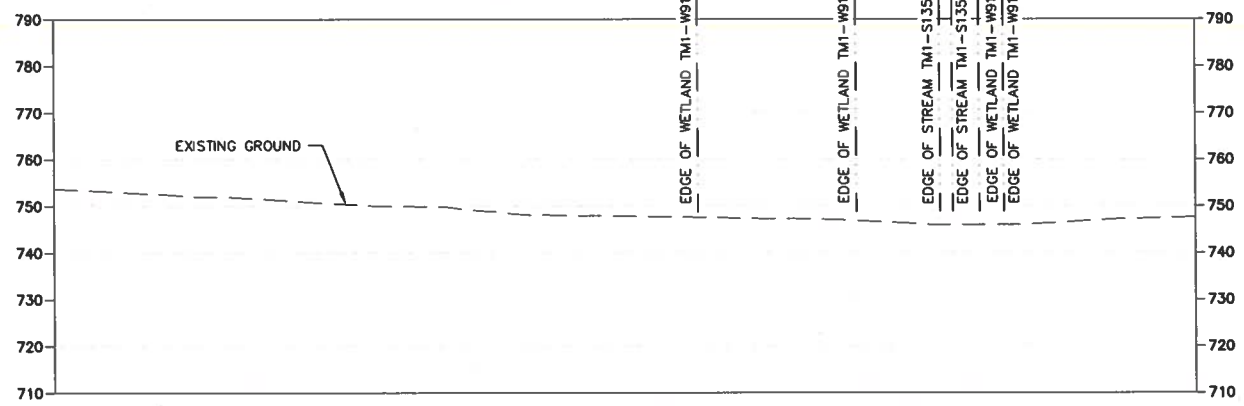


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S136 PROFILE



STREAM TM1-S135 & WETLAND TM1-W91 PROFILE

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S135	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-W91	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	956	N/A	3,168
TM1-S136	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-S137	R3	0	0	0	0	0	0	N/A	N/A	3390	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-LEGEND
CGTL8000-PL
HEXAGON KEYNOTES_50 Scale
HEXAGON KEYNOTES_20 Scale

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000 0001 - LINE 8000\SHEETS\CROSSINGS\X-36B.DWG Scale:1:1 SavedDate:11/27/2018 Plot Date:11/27/2018 Time:19:19 Plot Date: Hunter, Owen; 12/11/2018; 13:47 ; Layout:62

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets

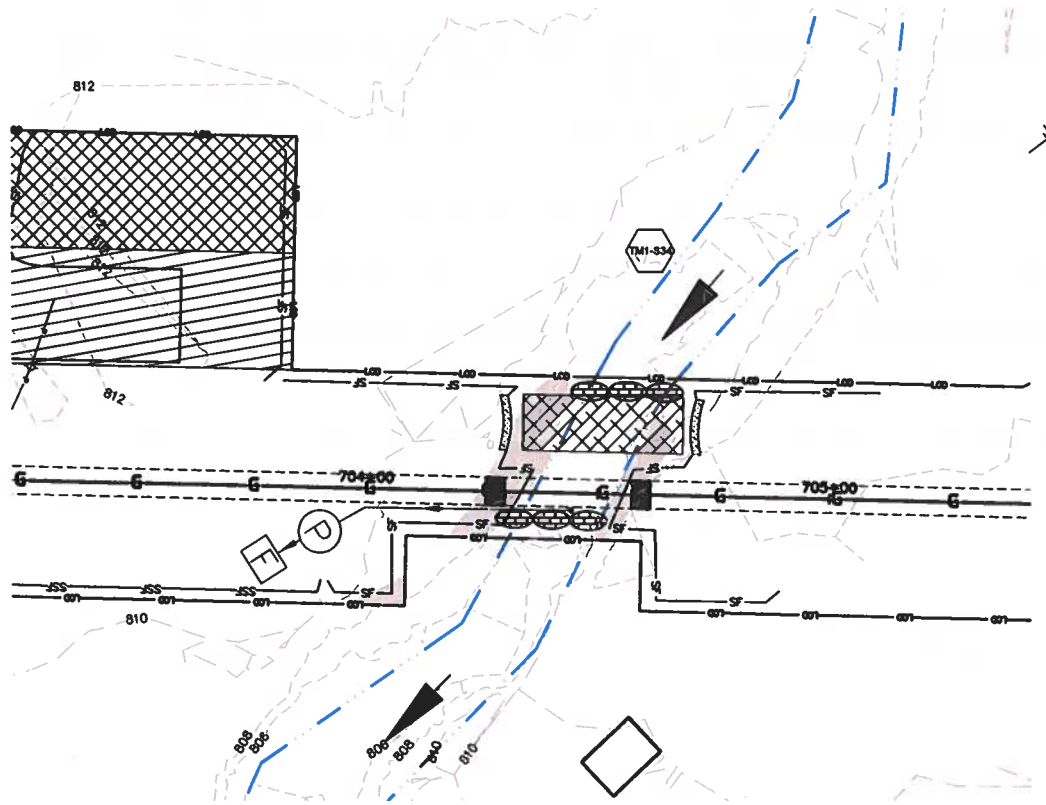
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

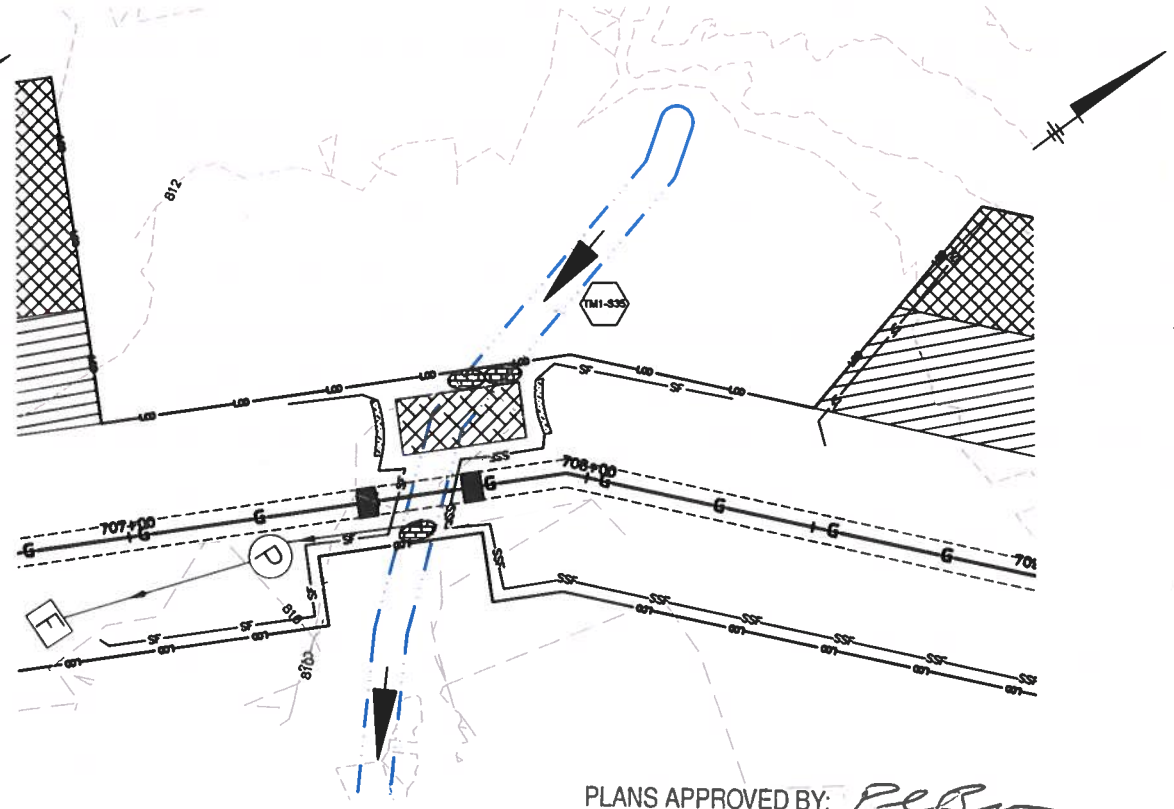
ACCESS ROAD CROSSINGS TMI-S135, TM1-S136, AND TM1-W91

ARCADIS Project No: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel: 315.671.9545

X-36B

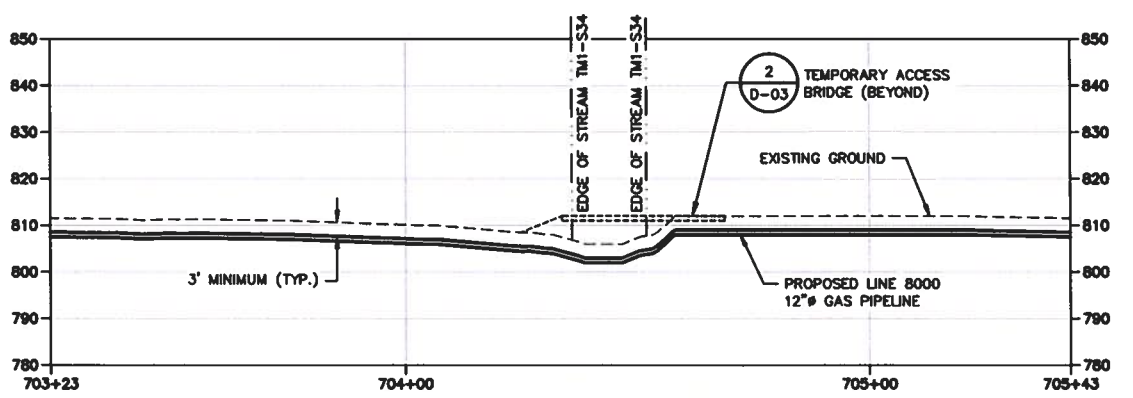


PLAN

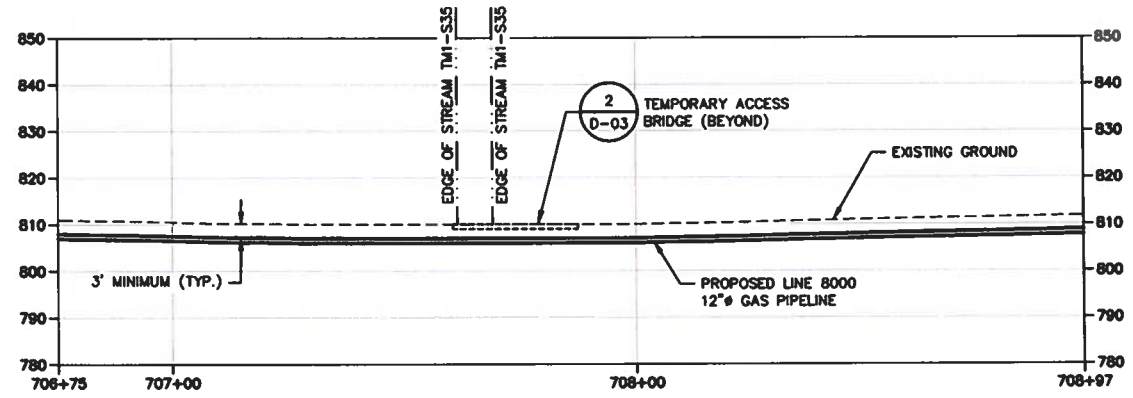


PLAN

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S34 PROFILE



STREAM TM1-S35 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S34 (new pipe installation)	R3	14	32	448	N/A	N/A	N/A	N/A	570	N/A	N/A	N/A
TM1-S35 (new pipe installation)	R4	7	38	266	N/A	N/A	N/A	N/A	300	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01 / 4 D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03 / 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01 / 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34r22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852

Designed by	Drawn by	Checked by
SES	BJJ	MBH

State	Date Signed	Project Mgr.
MD	11/28/2018	JD

ARCADIS U.S., INC.
Design & Consultancy for natural and built assets

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

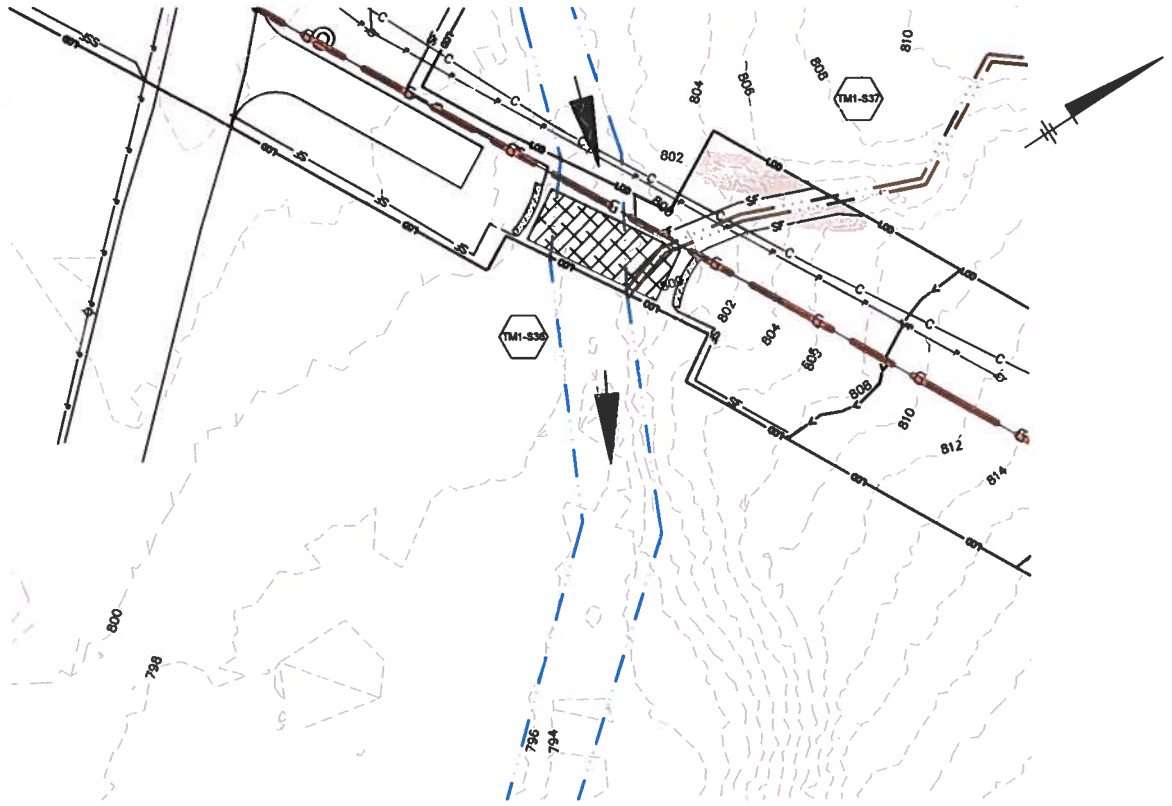
TM1-S34 AND TM1-S35 CROSSINGS

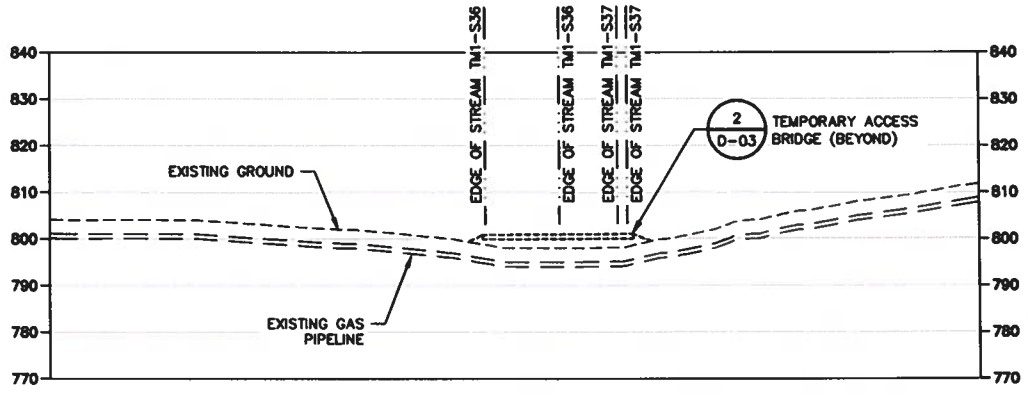
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-38

User:BJACKSON Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-38.DWG Scale:1:1 SavedDate:11/28/2018 Time:16:00 Plot Date: Steele, Sam; 11/28/2018; 18:19 ; Layout64





EXISTING CROSSINGS STREAMS TM1-S36 AND TM1-S37 PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permenent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S36 (existing ROW for access)	R4	0	0	0	N/A	N/A	N/A	N/A	500	N/A	N/A	N/A
TM1-S37 (existing ROW for access)	R8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R8) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

PLANS APPROVED BY: PeBr
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSECT
CGTL8000-PL
HEXAGON KEYNOTES

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADDACADPROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-39.DWG Scale:1:1 Saved/Date:11/26/2018 Time:16:00 Plot Date: Steele, Sam; 11/26/2018; 18:47 ; Layout:65

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

STATE OF MARYLAND — MICHAEL B. HIGGINS — PROFESSIONAL ENGINEER

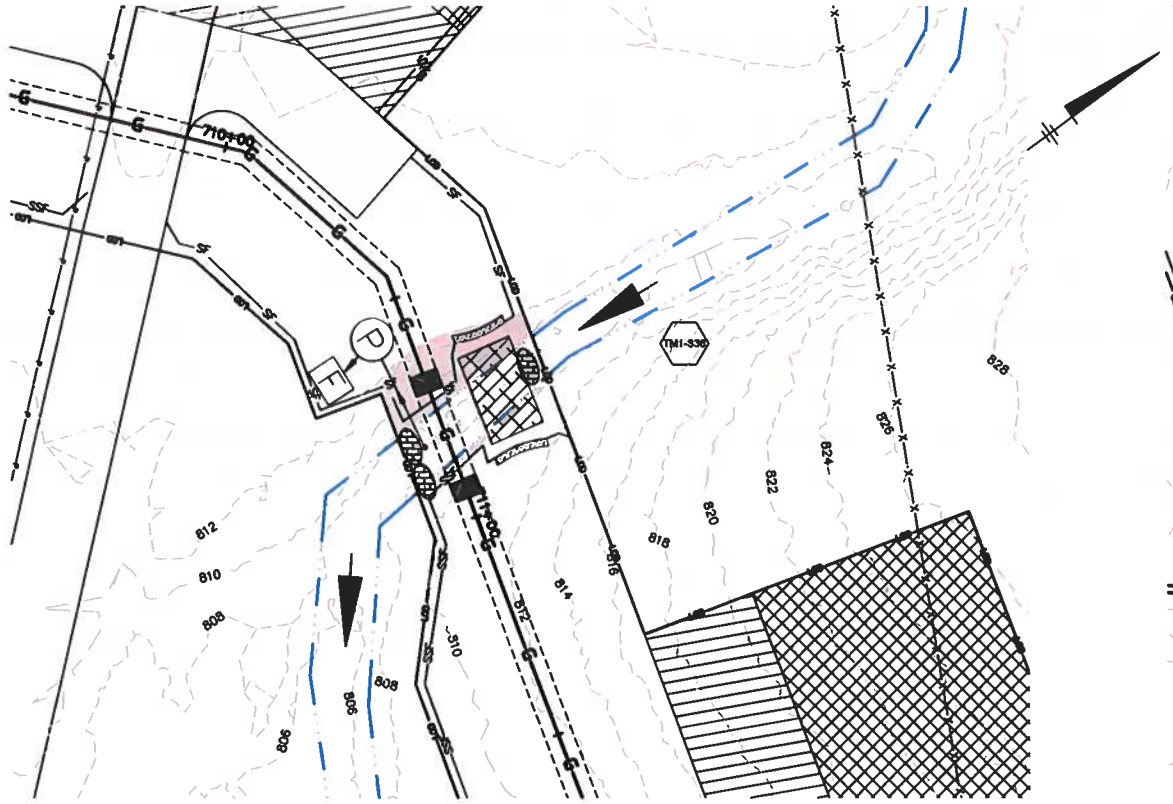
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSINGS TM1-S36 AND TM1-S37

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

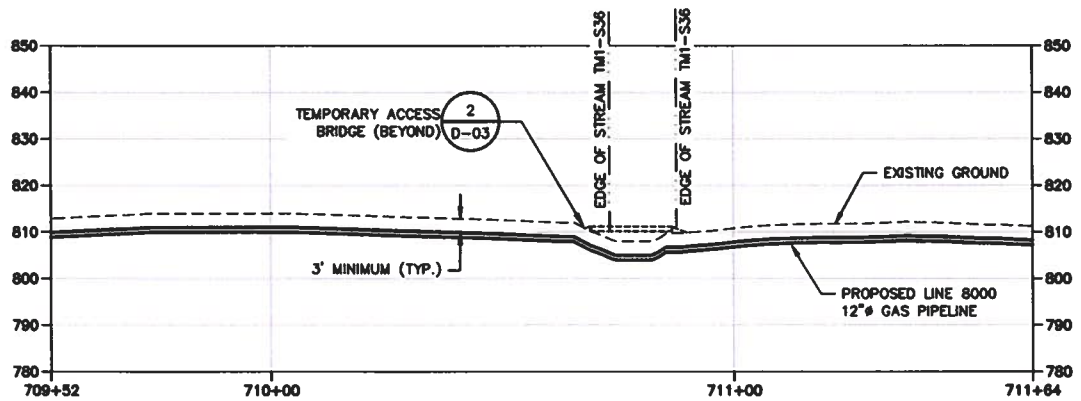
X-39



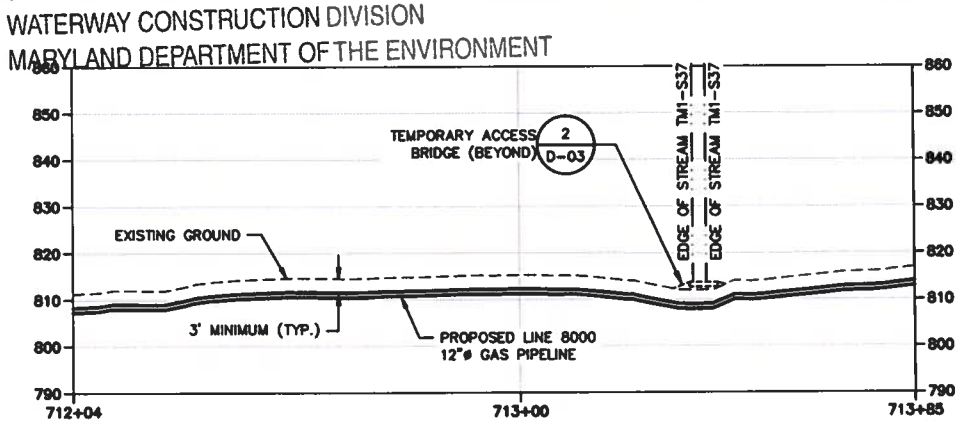
PLAN

PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S36 PROFILE



STREAM TM1-S37 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S36 (new pipe installation)	R4	7	33	231	N/A	N/A	N/A	N/A	330	N/A	N/A	N/A
TM1-S37 (new pipe installation)	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-08.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XSCT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

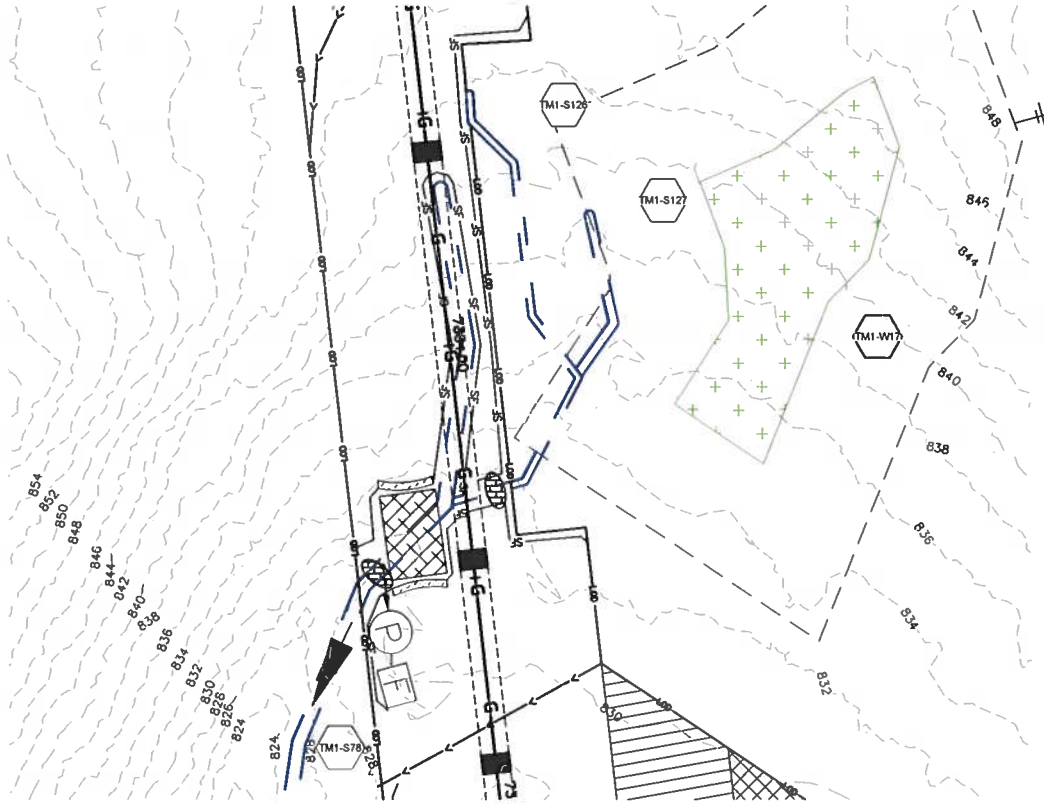
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S36 AND TM1-S37 CROSSINGS

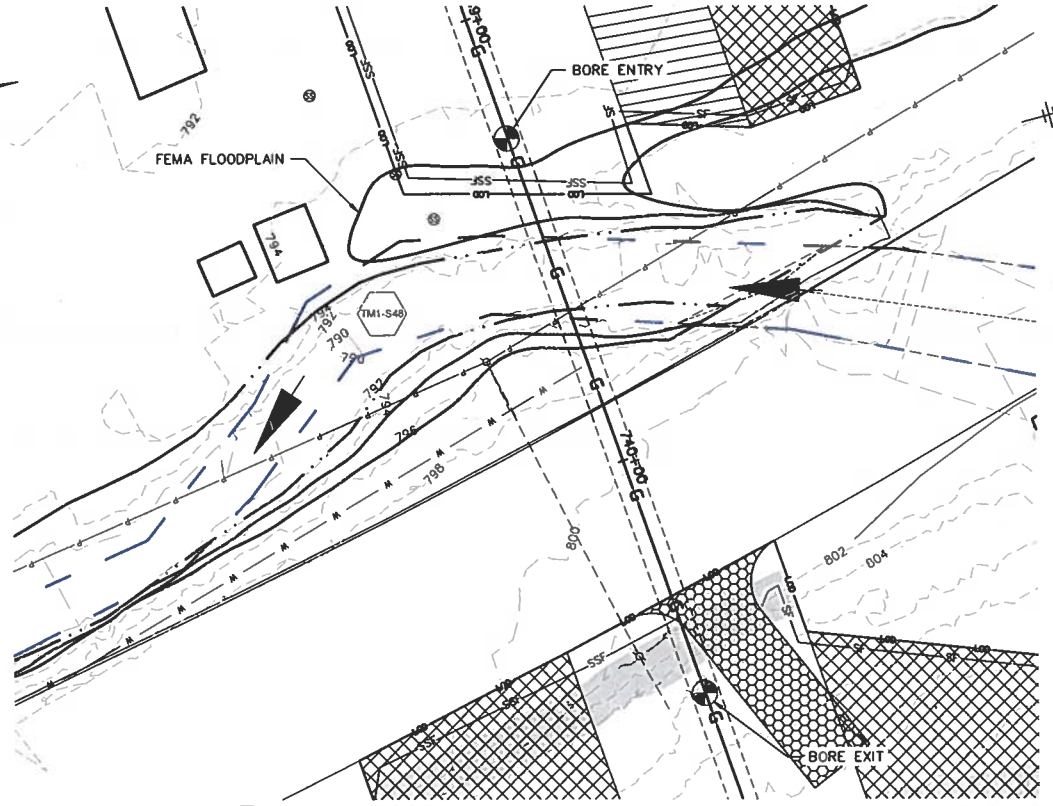
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-40

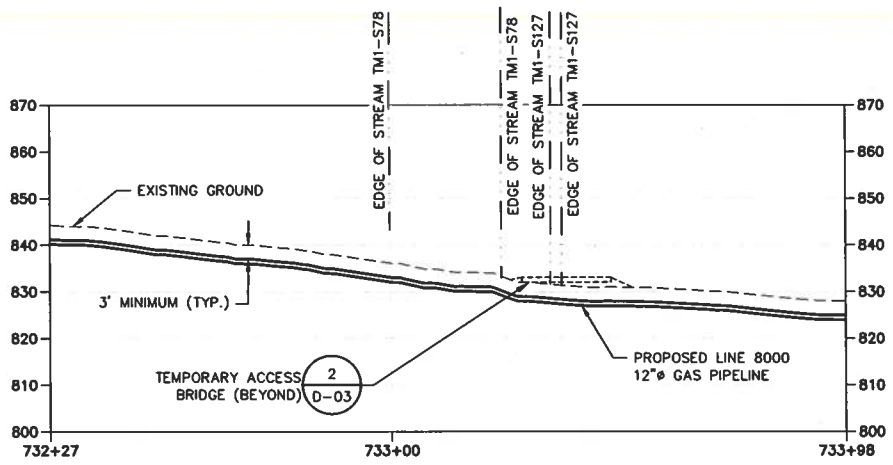


PLAN

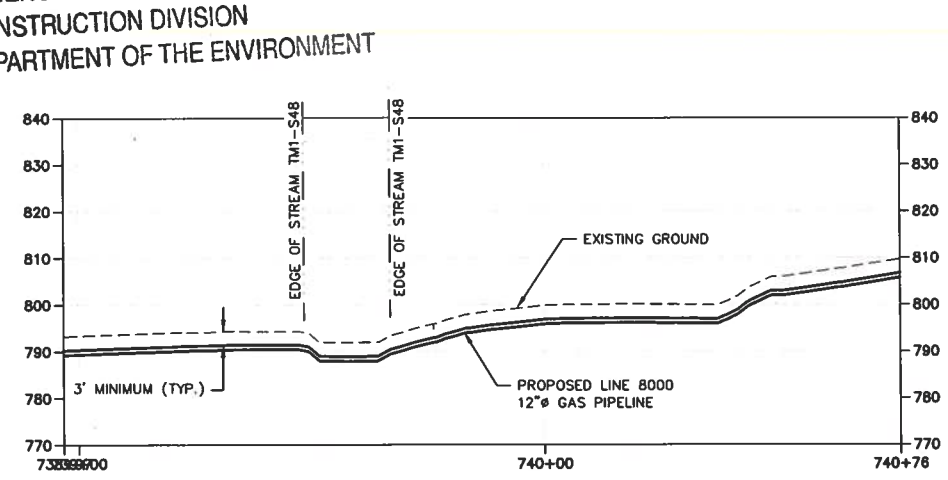


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S78 PROFILE



STREAM TM1-S48 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S48 (Warrior's Run)	R3	0	0	0	N/A	N/A	N/A	28,466	N/A	28,466	N/A	N/A	N/A
TM1-S78	R4	3	91	273	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-S126	R4	2	10	20	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-08. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES_60 Scale
HEXAGON KEYNOTES_20 Scale
CGTL8000-ESC_SANDBAGS ONLY

IMAGES:

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING.

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC.
Design & Consultancy for natural and built assets

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

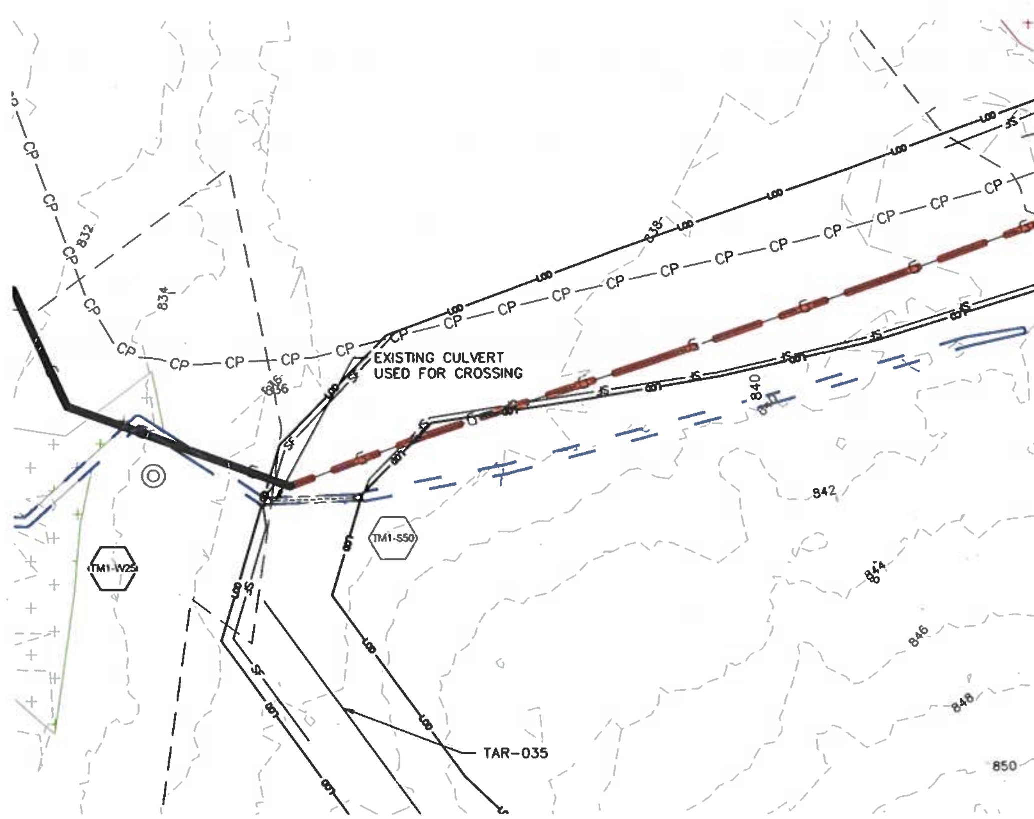
TM1-S78, TM1-S127, TM1-W17, AND TM1-S48 CROSSINGS

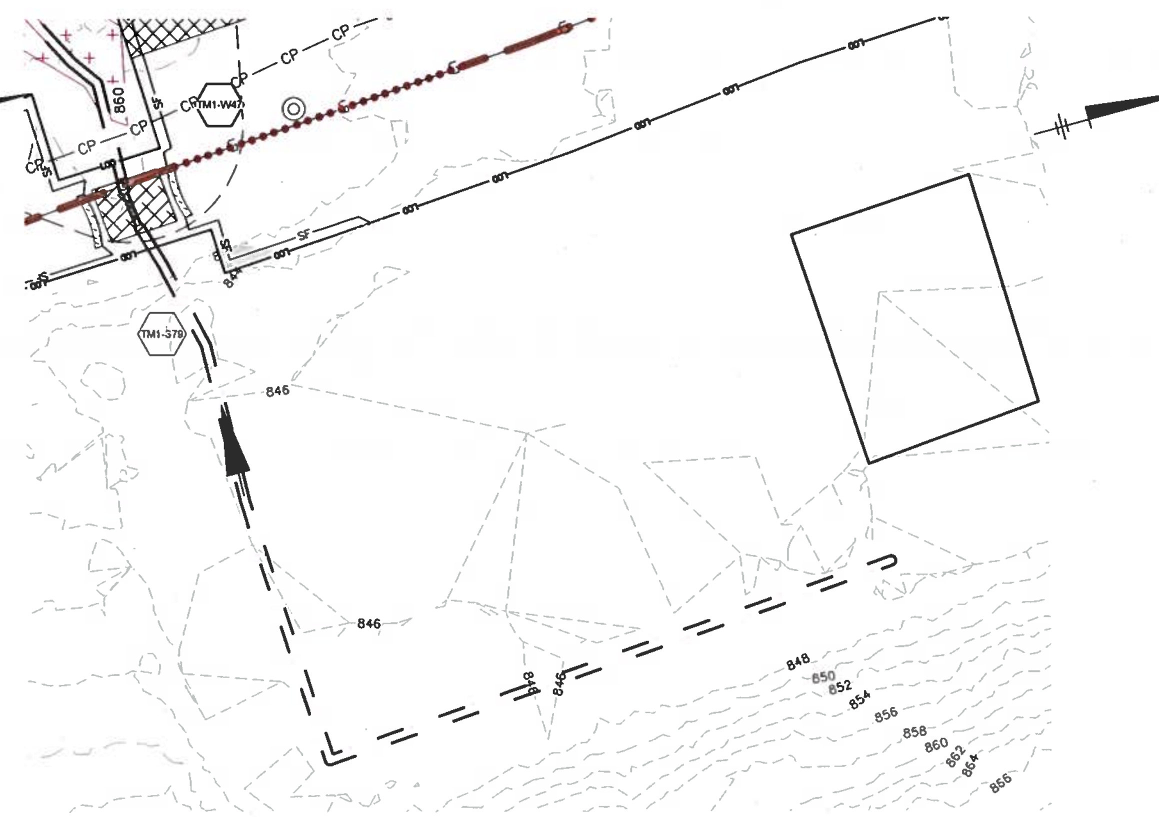
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-41

User:TTITTLE Spec:AUS-NCSMOD File:G:\CADD\ACADPROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-41.DWG Scale:1:1 SavedDate:11/27/2018 Time:09:03 Plot Date: Hunter, Owen, 12/11/2018, 14:00 ,Layout:67

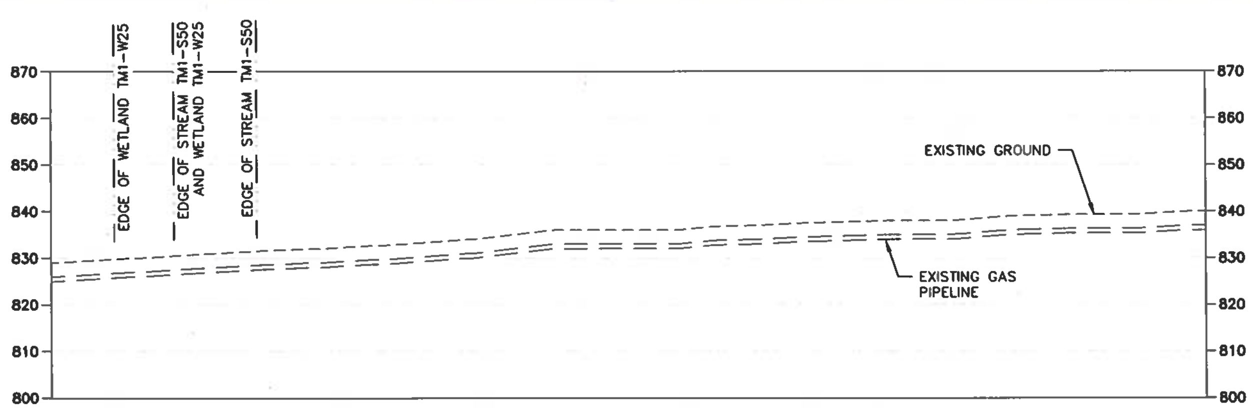




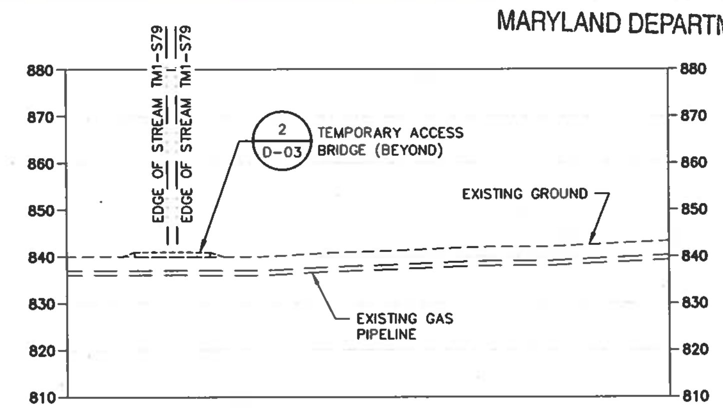
PLANS APPROVED BY: [signature]
DATE: 2/4/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- EXISTING GAS TRANSMISSION LINES
- 100+00 — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24 — 24" COMPOST FILTER SOCK (1 / D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03) (1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01) (2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



STREAM TM1-S50 AND WETLAND TM1-W25 PROFILE



STREAM TM1-S79 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S50	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-W25	PFO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	2
TM1-S79	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-W47	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,972
TM1-S48 (Warrior's Run Floodplain)	R3	N/A	N/A	N/A	N/A	N/A	N/A	28,466	N/A	28,466	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-XCT, CGTL8000-PL, HEXAGON KEYNOTES_20 Scale, HEXAGON KEYNOTES_60 Scale
IMAGES:

1"=20' 20' 0 20' 40'
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

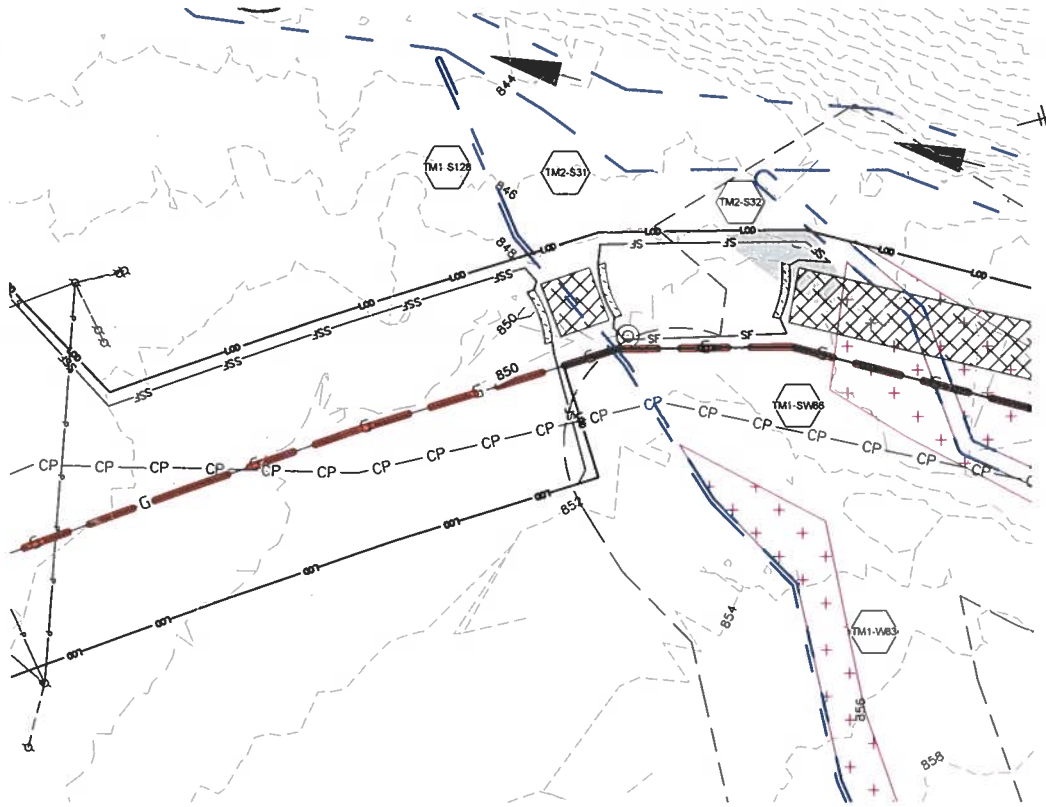
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

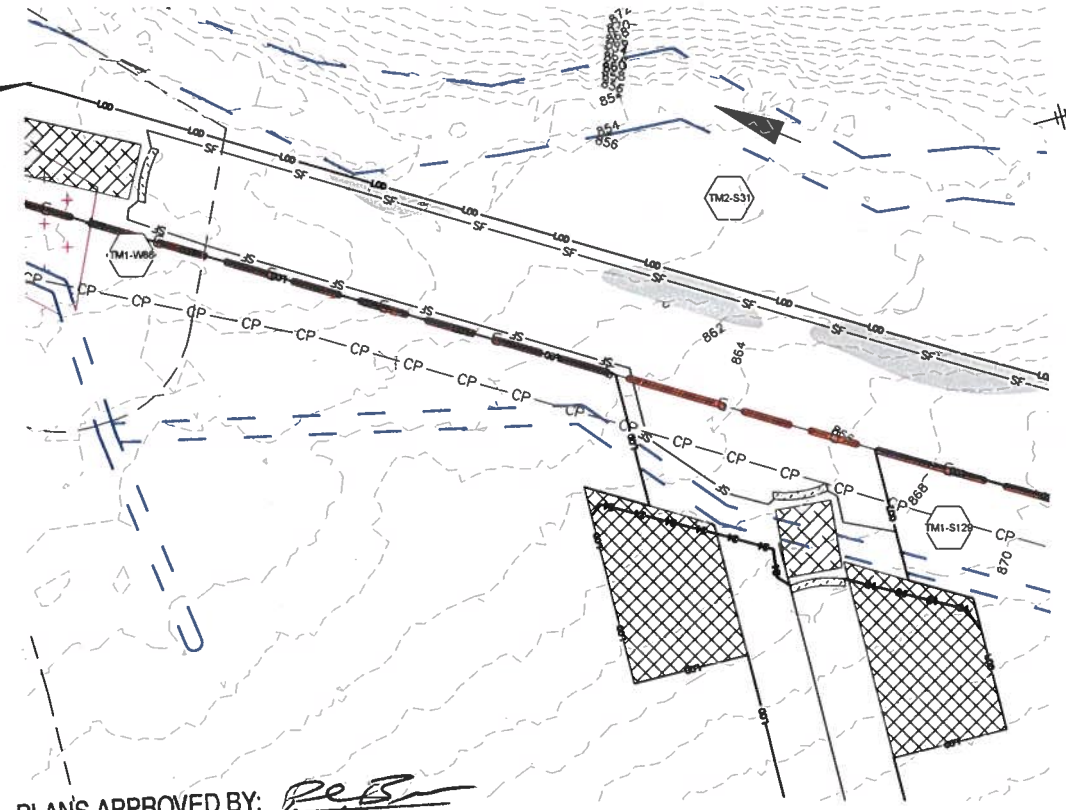
EXISTING CROSSINGS TM1-S50 AND TM1-W47

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315 671 9545

X-42

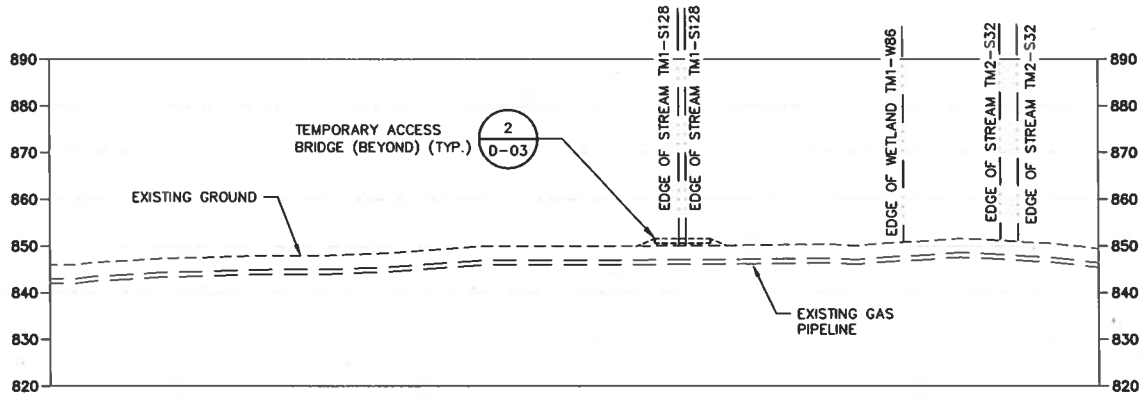


PLAN

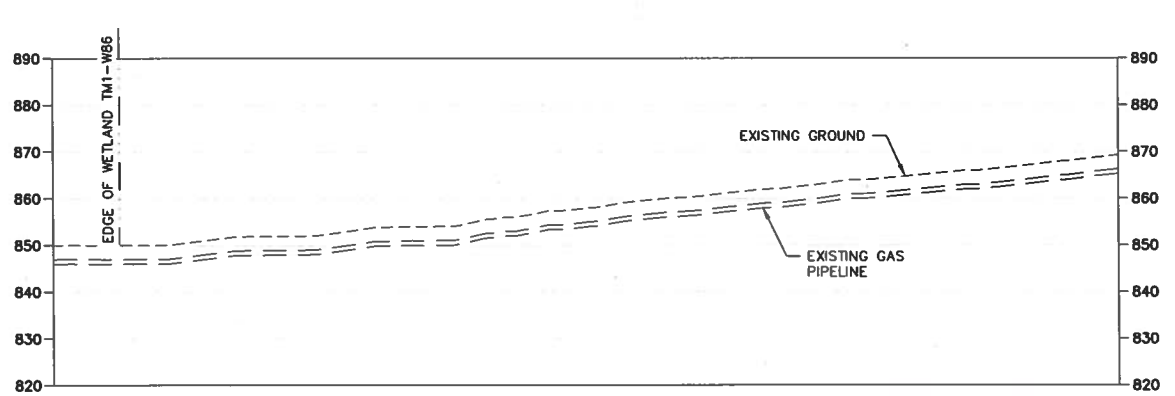


PLAN

PLANS APPROVED BY: PES
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM1-S128, TM2-S32, AND WETLAND TM1-W86 PROFILE



WETLAND TM1-W86 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S48 (Warrior's Run Floodplain)	R3	N/A	N/A	N/A	N/A	N/A	N/A	28,466	N/A	28,466	N/A	N/A	N/A
TM2-S31	R3	0	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-S32	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	680	N/A	N/A	N/A
TM1-S128	R4	1	0	0	N/A	N/A	N/A	N/A	N/A	140	N/A	N/A	N/A
TM1-W83	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	162
TM1-W86	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	841	N/A	1,857
TM1-S129	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	80	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-XCT
HEXAGON KEYNOTES_20 Scale
HEXAGON KEYNOTES_60 Scale

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS U.S., INC.
Design & Consultancy for natural and built assets

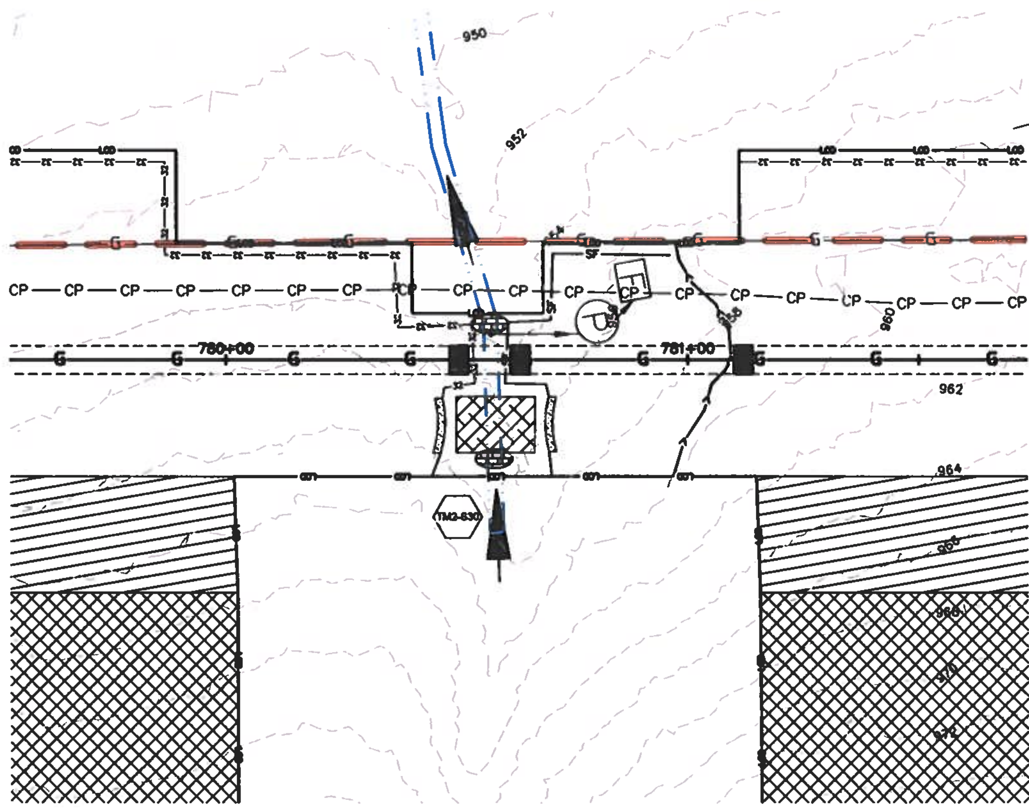
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSINGS TM1-S128, TM1-S129, TM2-S32, AND TM1-W86

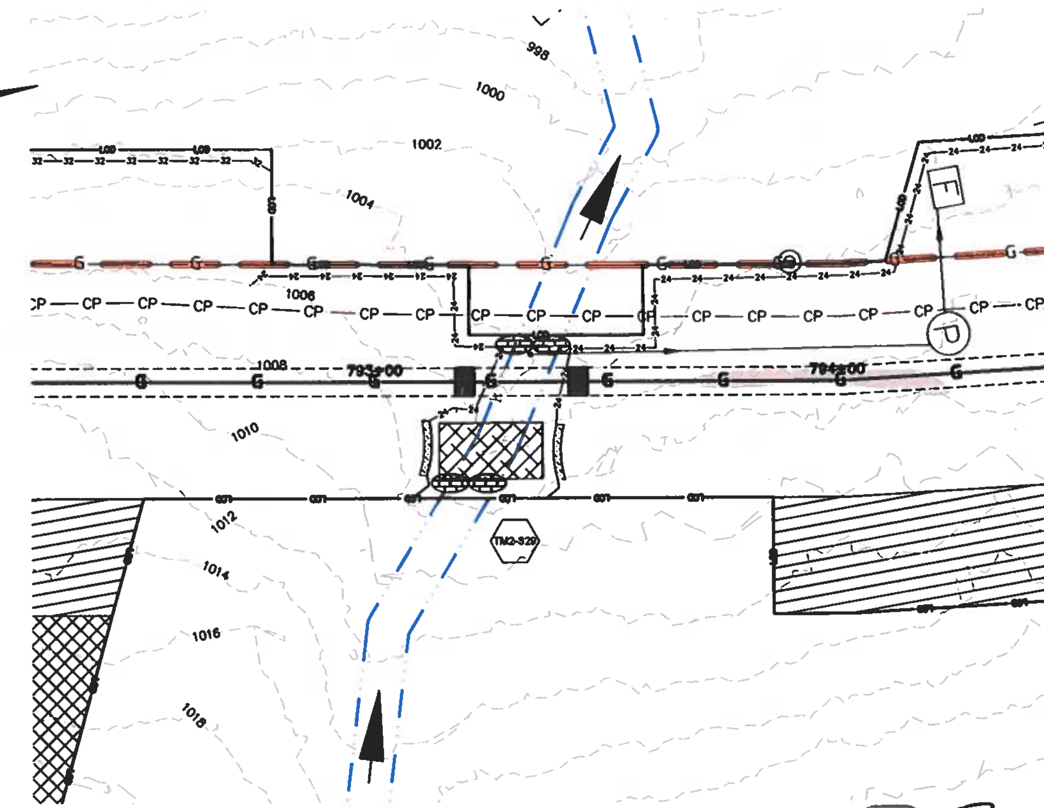
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-43

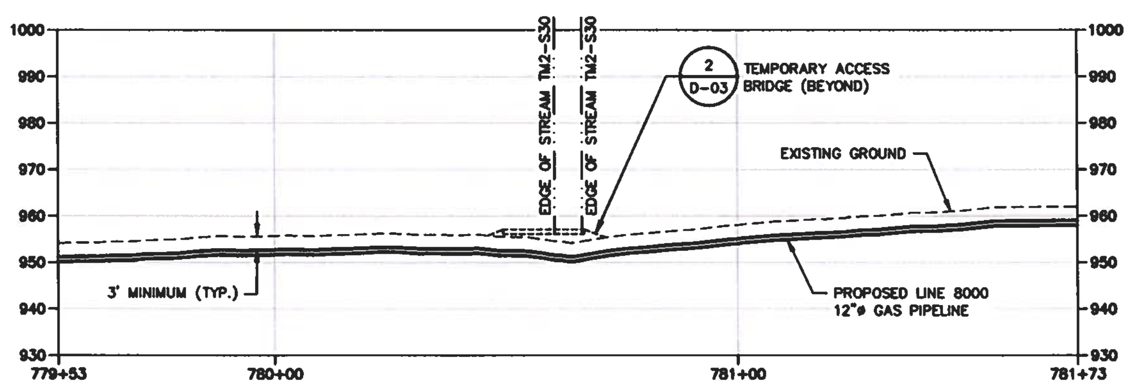


PLAN

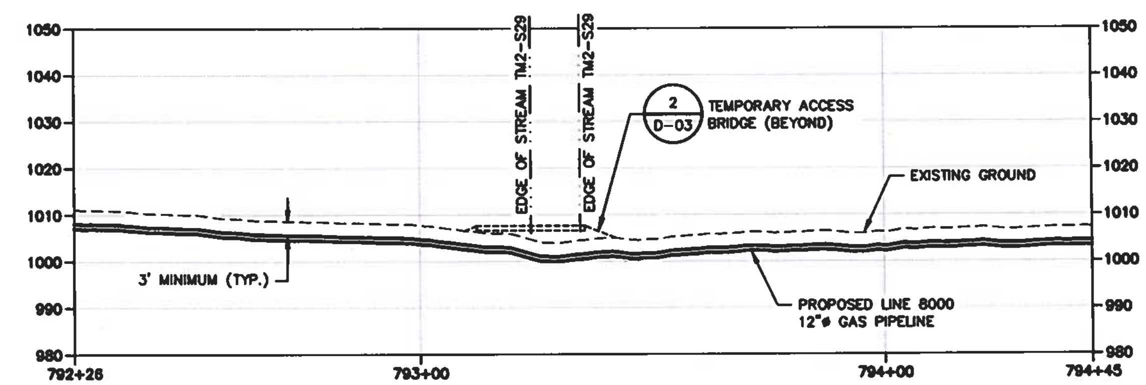


PLAN

PLANS APPROVED BY:
DATE: 2/4/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



STREAM TM2-S30 PROFILE



STREAM TM2-S29 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S29	R3	9	35	315	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM2-S30	R4	3	32	96	N/A	N/A	N/A	N/A	280	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- —G— EXISTING GAS TRANSMISSION LINES
- 100+00 —G— PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- —LOD— LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- —SF— SILT FENCE (3 / D-01)
- —SSF— SUPER SILT FENCE (4 / D-01)
- —24—24— 24" COMPOST FILTER SOCK (1 / D-07)
- —32—32— 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P—F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03) (1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01) (2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

IMAGES:

1"=20' — 20' 0 20' 40'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

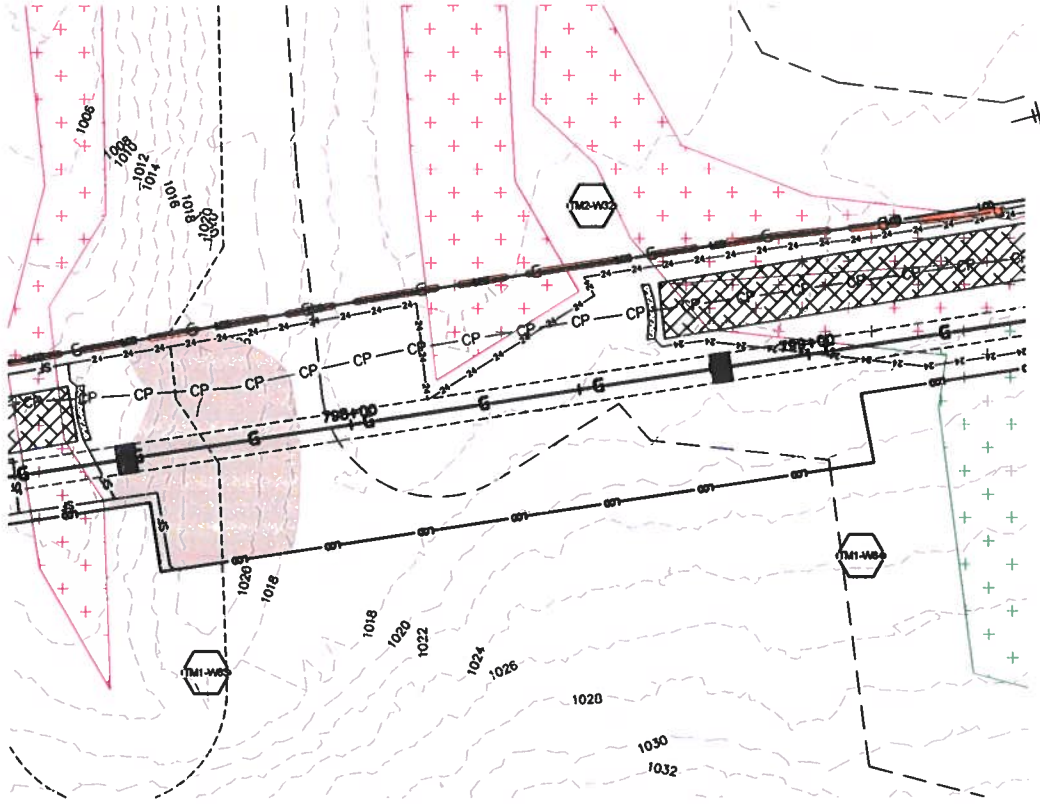
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

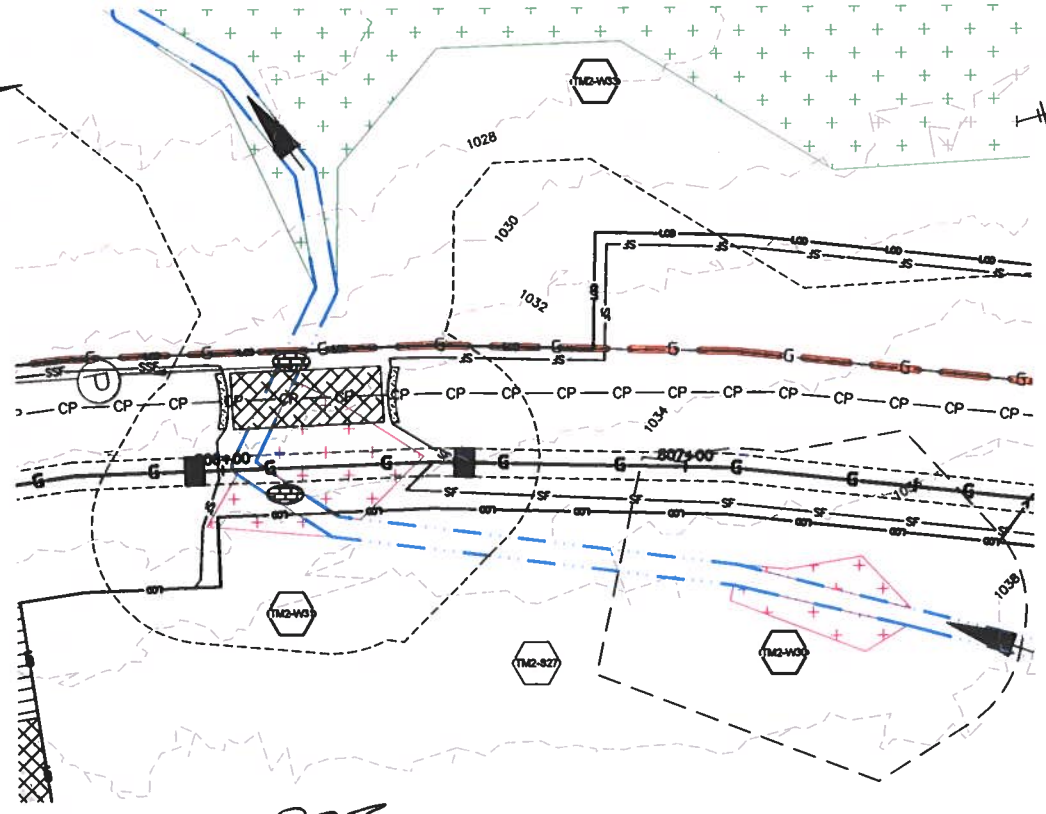
TM2-S30 AND TM2-S29 CROSSINGS

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-44

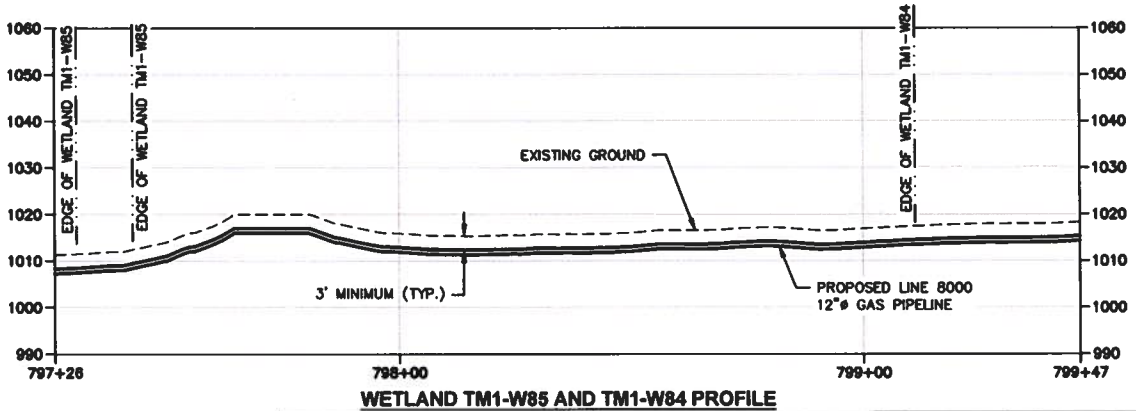


PLAN

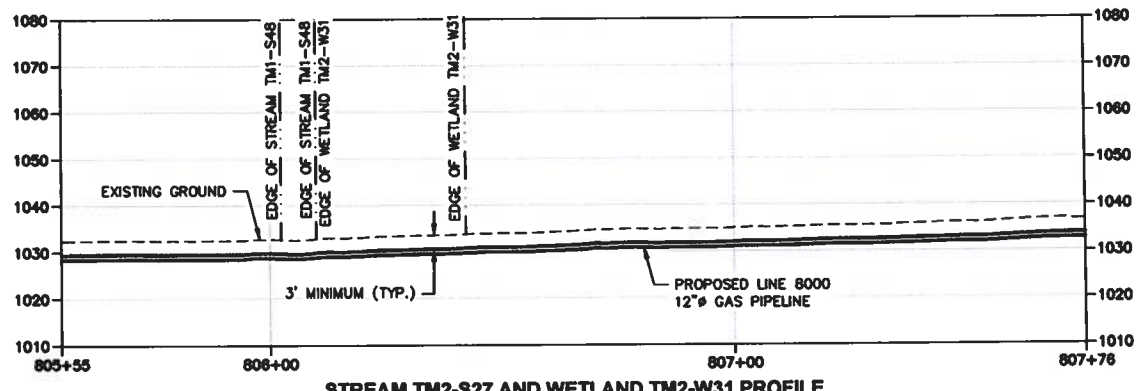


PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



WETLAND TM1-W85 AND TM1-W84 PROFILE



STREAM TM2-S27 AND WETLAND TM2-W31 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S27	R3	6	37	333	N/A	N/A	N/A	N/A	686	N/A	N/A	N/A
TM2-W30	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,082
TM2-W31	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	682	N/A	2,735
TM2-W32	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	402	N/A	2,438
TM2-W33	PFO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	1,140
TM1-W85	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	397	N/A	2,518
TM1-W84	PFO/PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,558	1,189	6,866

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-ACT
CGTL8000-RST
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS	
Professional Engineer's No.	MD 52652	
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

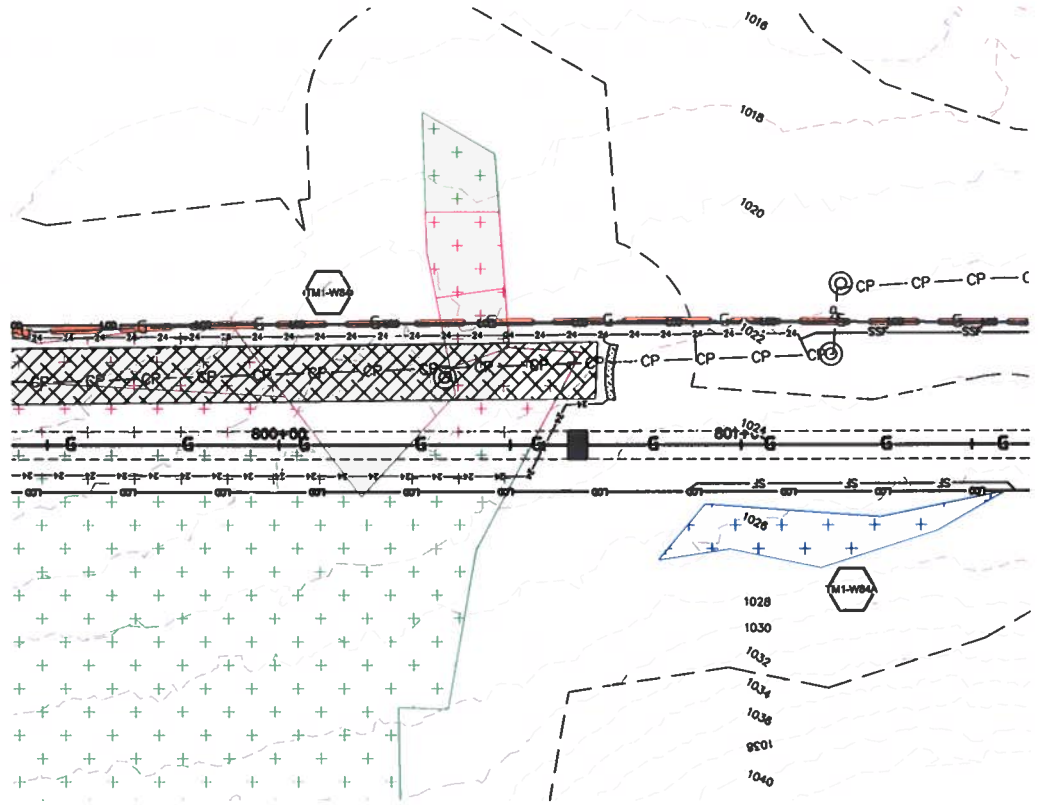
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

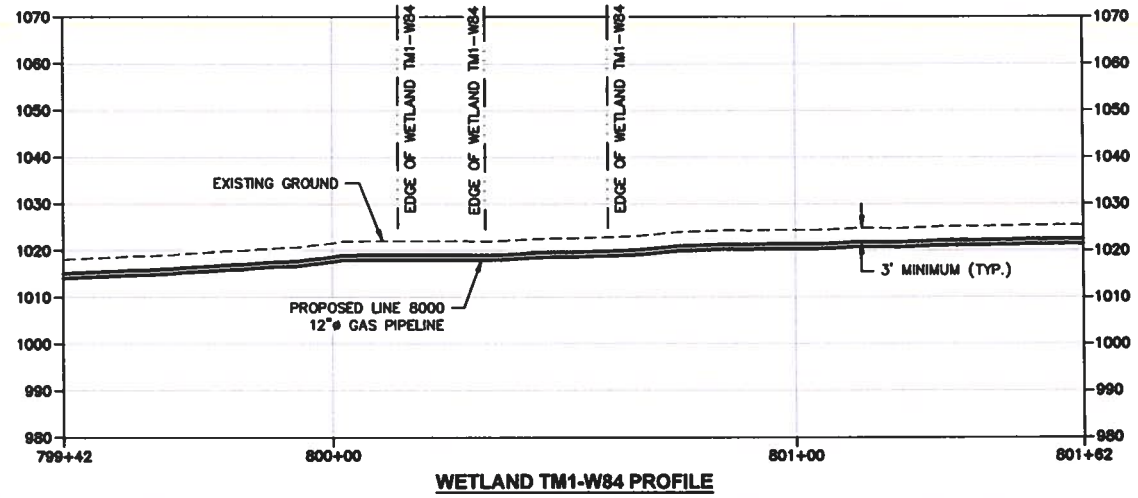
TM2-W32, TM1-W84, TM2-31, TM2-S27 AND TM2-W30 CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-45



PLAN



WETLAND TM1-W84 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-W84	PFO/PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3,558	1,169	6,866
TM1-W84A	PSS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	2,550

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-PL
CGTL8000-ECC
CGTL8000-XSECT
HEXAGON KEYNOTES

User:OHUNTER Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-45A.DWG Scale:1:1 SavedDate:11/26/2018 Time:16:02 Plot Date: Steele, Sam; 11/27/2018; 09:10 ; Layout:74

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

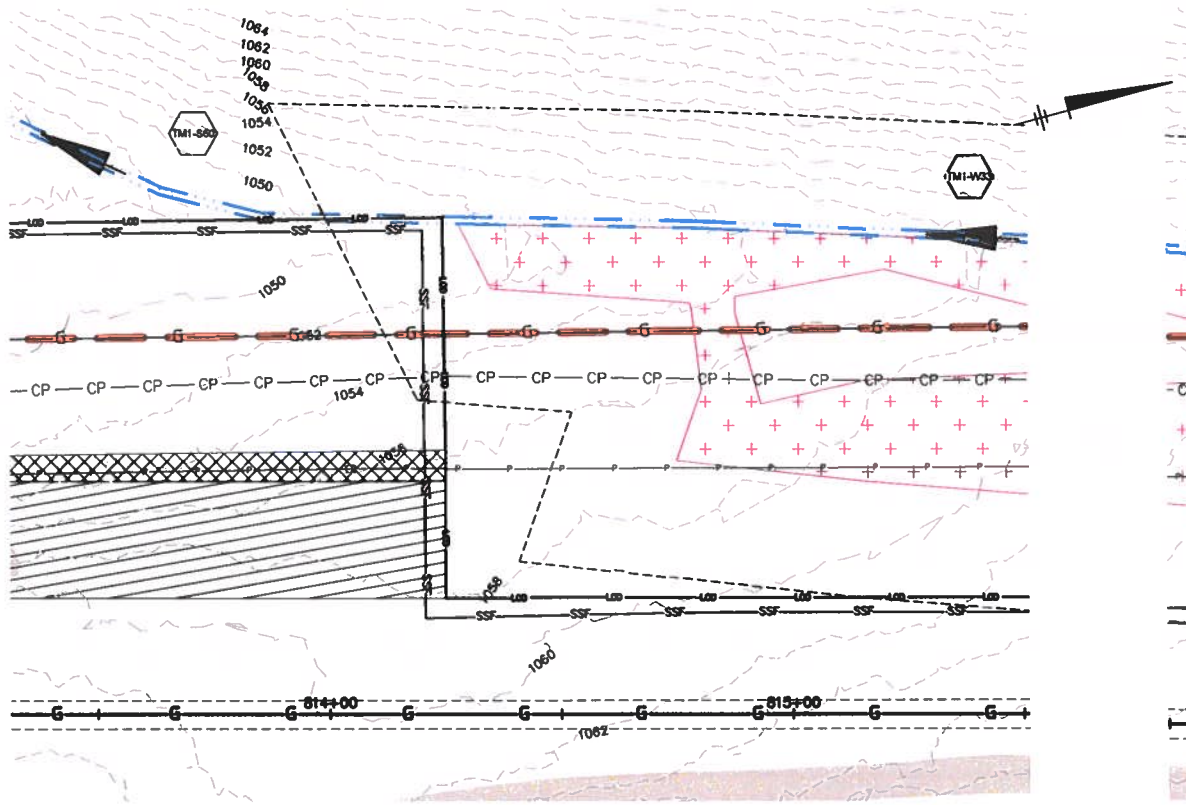
ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

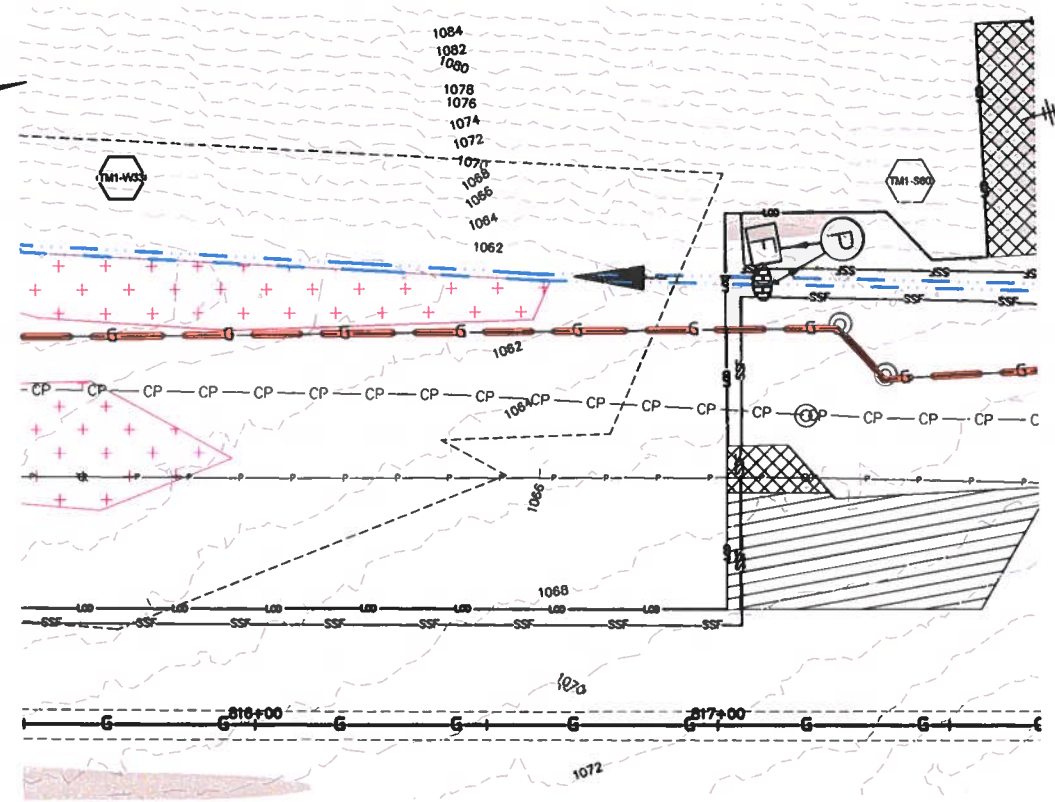
TM1-W84 AND TM1-W84A CROSSINGS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-45A

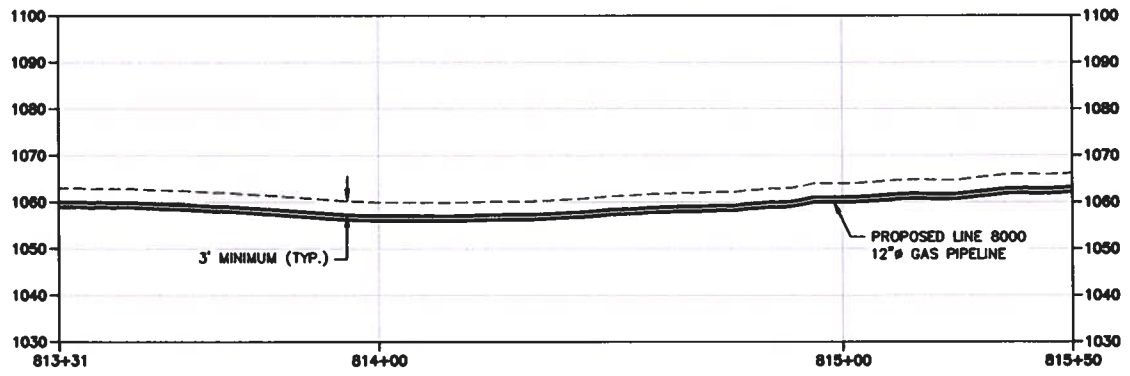


PLAN

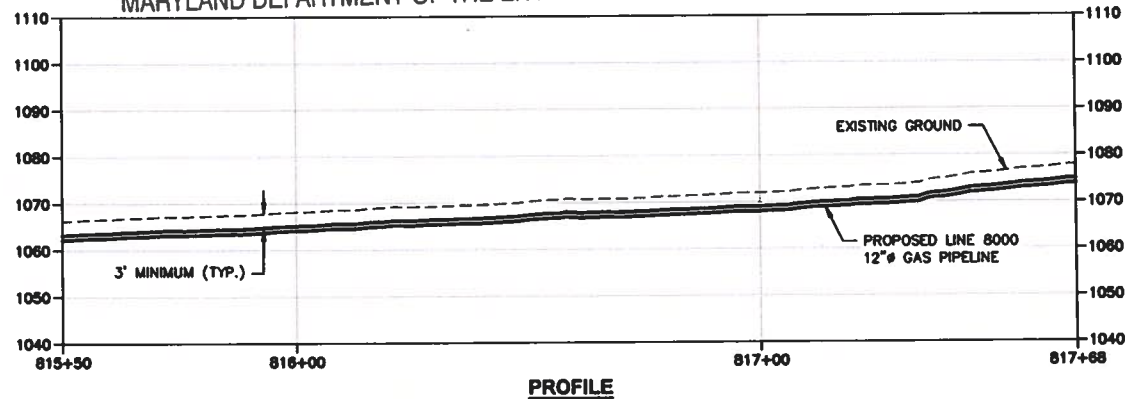


PLAN

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 26-ft Wetland Buffer Impact (sq ft)
TM1-W33	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	710
TM1-S60	R4	2	104	208	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01 / 4 D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03 / 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01 / 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-ACT
CGTL8000-ALL
HEXAGON KEYNOTES

1" = 20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

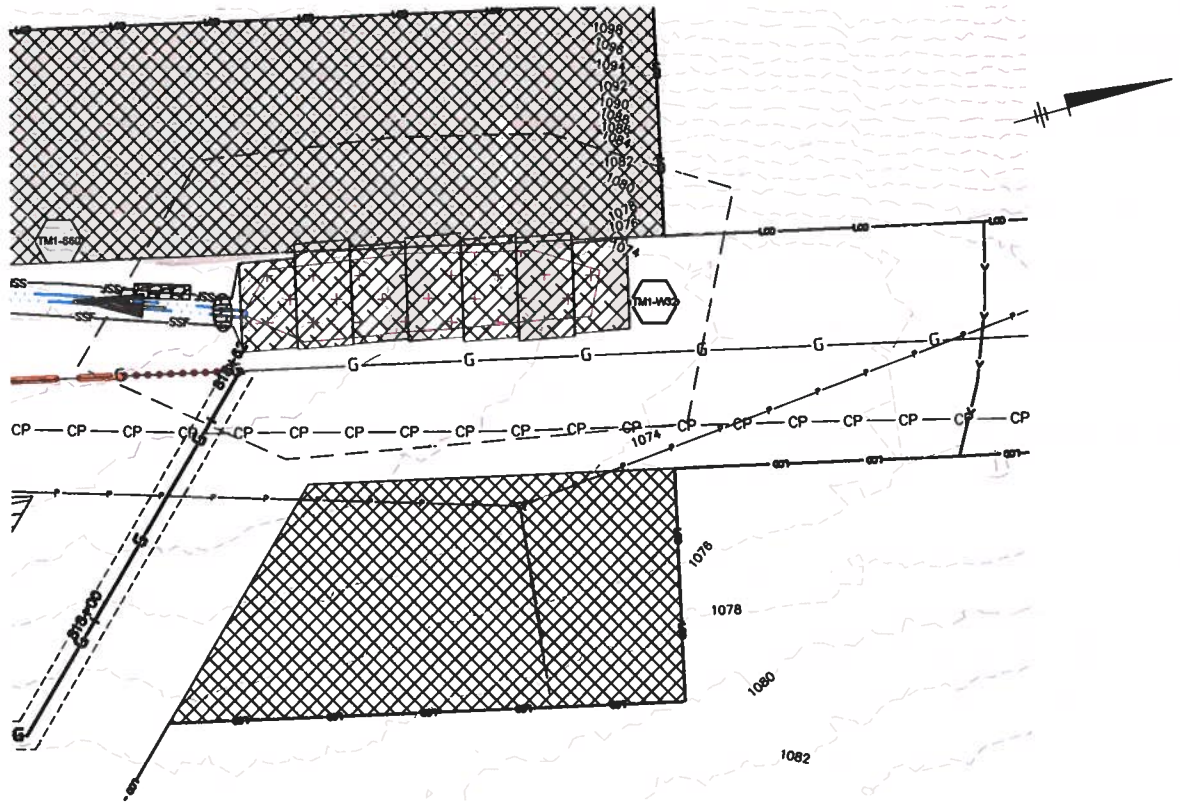
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-33 CROSSING

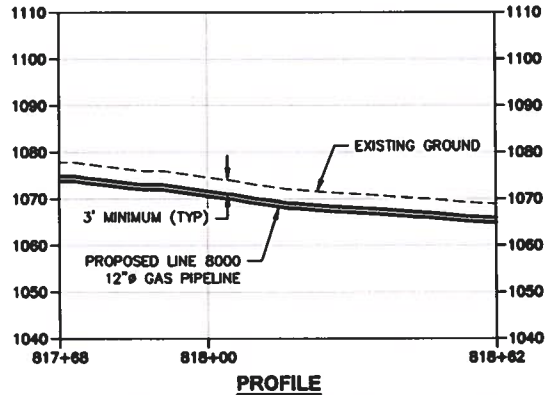
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

X-46



PLAN



PROFILE

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S80	R4	2	104	208	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-W32	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1,113	N/A	6,127

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES
1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PE
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

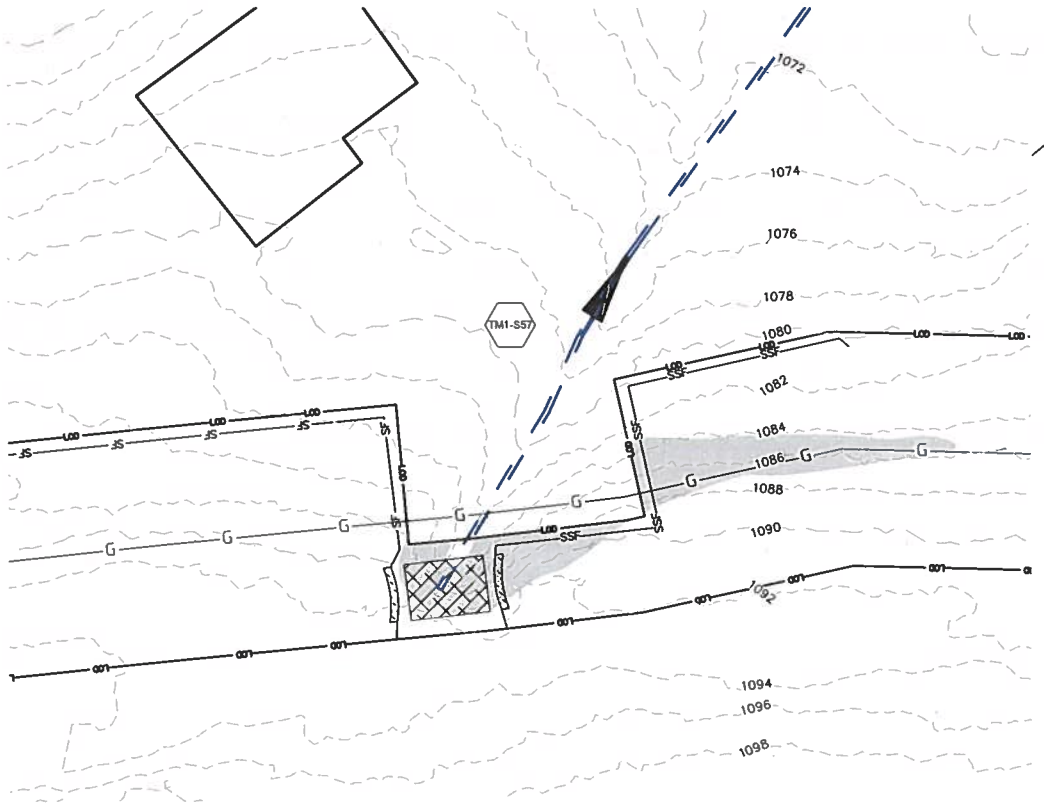
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

TM1-S80 AND TM1-W32 CROSSINGS

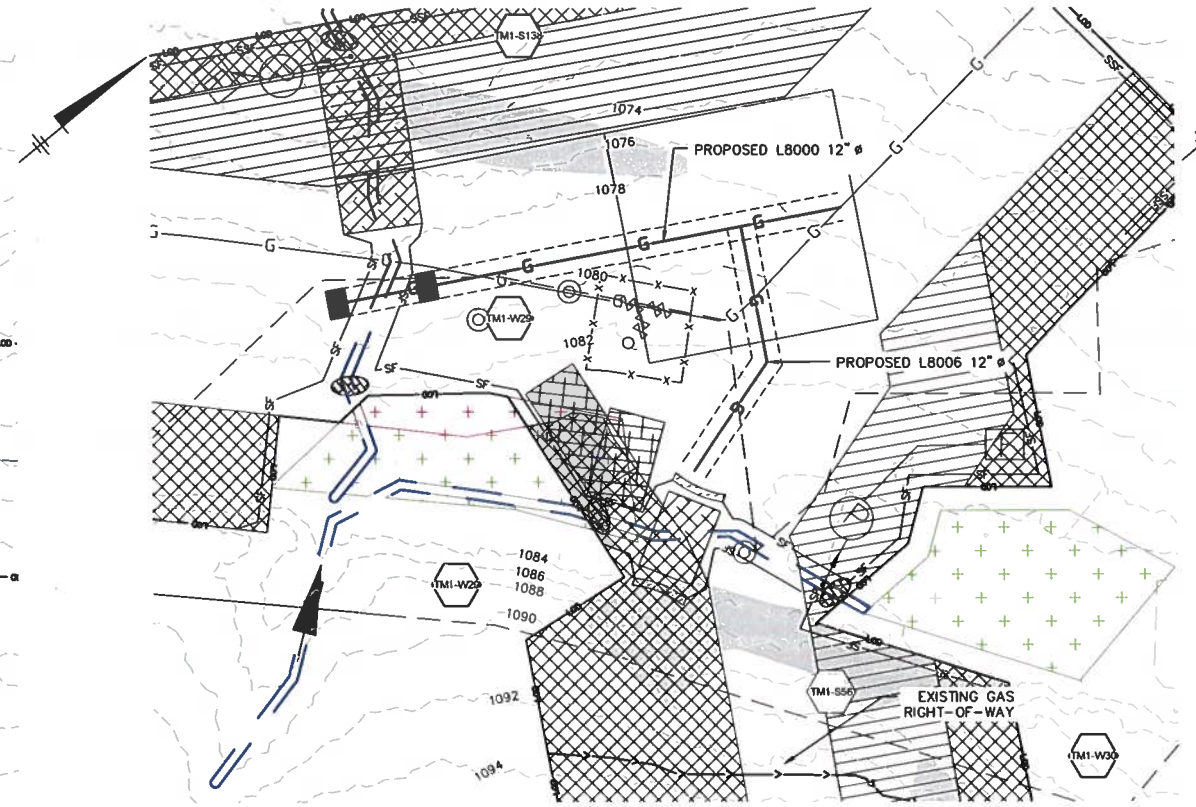
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

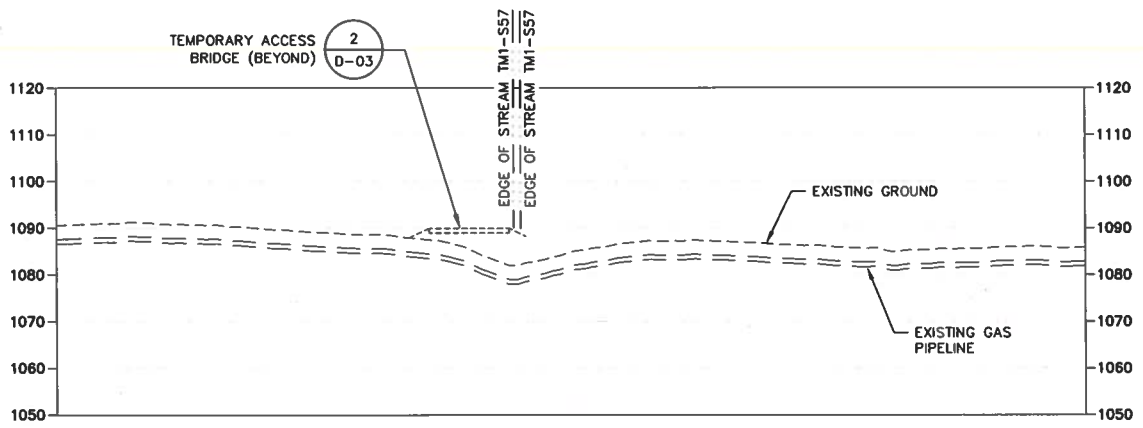
X-47



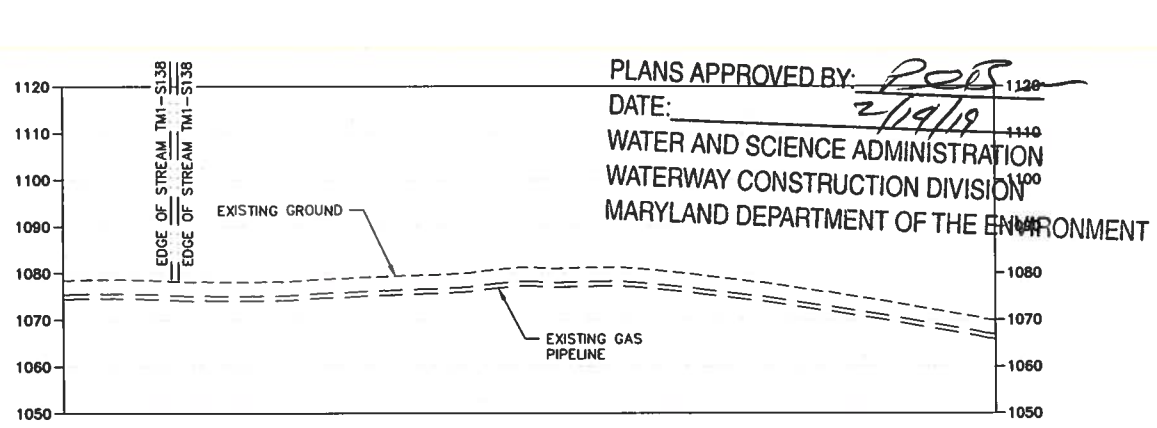
PLAN



PLAN



STREAM TM1-S57 PROFILE



PROFILE

PLANS APPROVED BY:
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts: Temporary Stream Impact (width)	Stream Impacts: Temporary Stream Impact (Center)	Stream Impacts: Temporary Stream Impact (sq ft)	Stream Impacts: Permanent Stream Impact (width)	Stream Impacts: Permanent Stream Impact (center)	Stream Impacts: Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Floodplain Impacts: Permanent MDE Calculated Floodway Impact (sq. ft.) - See Note 4 on Drawing Sheets	Floodplain Impacts: Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Impacts: Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S56	R4	2	60	120	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-S57	R4	0	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-W29	PFO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	71	333	4,634
TM1-W30	PFO	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	2,627
TM1-S138	R4	2	84	168	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A

Notes.
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01, 4 D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-XCT
IMAGES:
HEXAGON KEYNOTES_20 Scale
HEXAGON KEYNOTES_50 Scale

User:SSTEELE Spec:AUS-NCSMOD File:G:\CADDACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\X-48.DWG Scale:1:1 SavedDate:12/11/2018 Time:15:13 Plot Date: Hunter, Owen, 12/11/2018, 18:18 , Layout:77

20' 0 20' 40'
1"=20'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

EXISTING CROSSINGS TM1-S57, TM1-W29, TM1-S56, AND TM1-W30

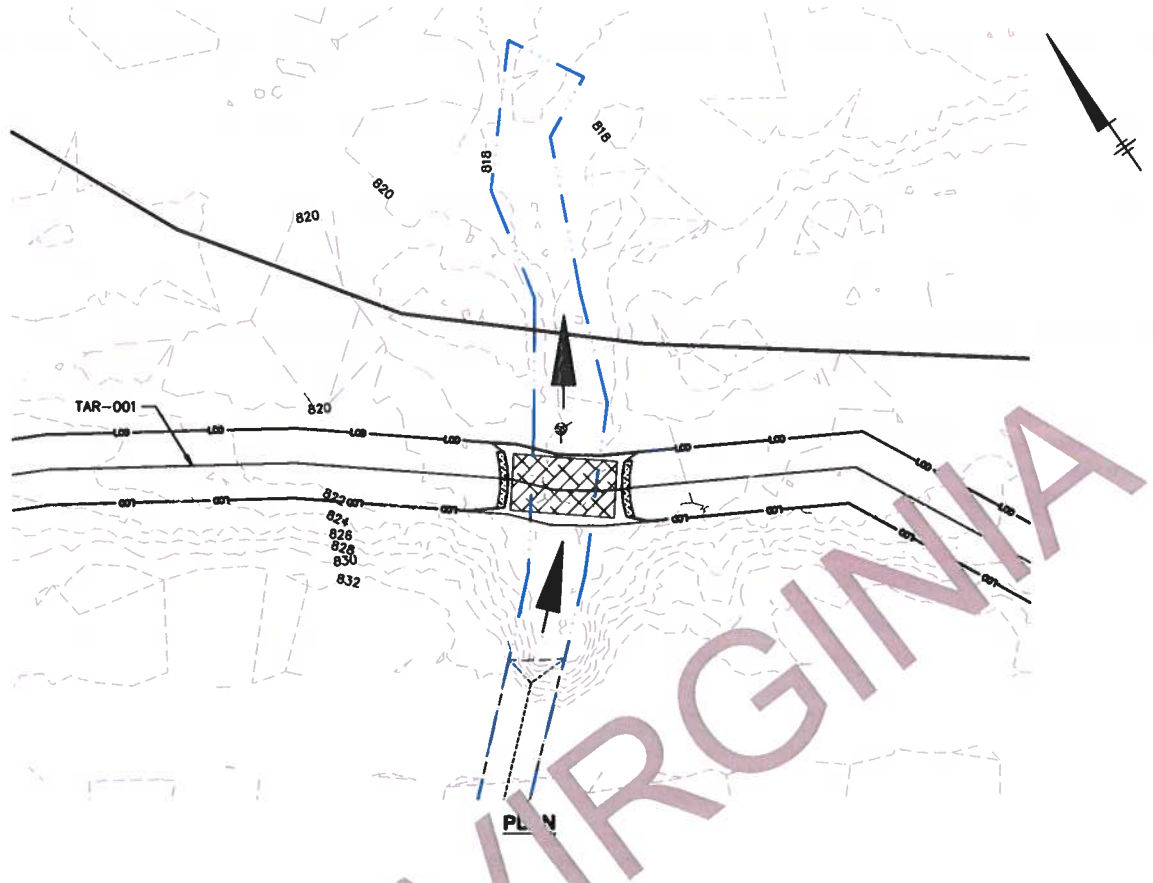
ARCADIS Project No.
CGTL8000.0001

Date
NOVEMBER 2018

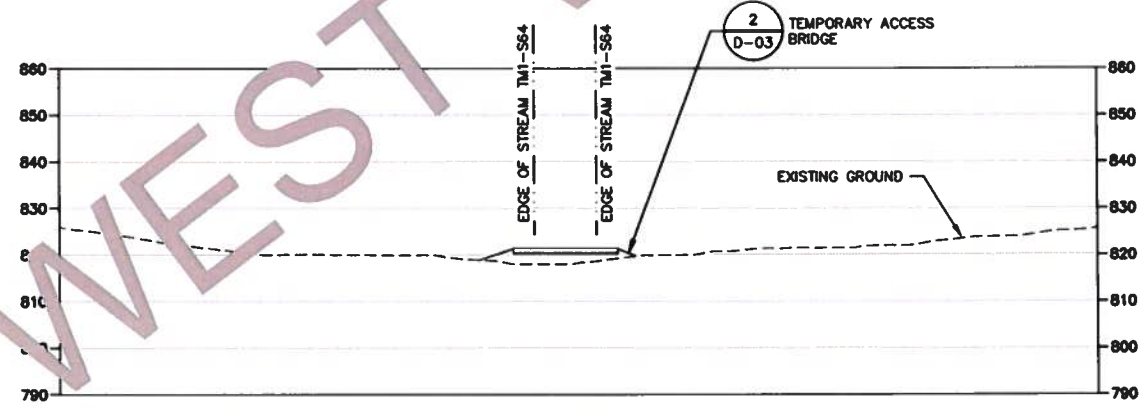
ARCADIS U.S., INC
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel 315 671 9545

X-48

77 OF 94



PLAN



STREAM TM1-S64 PROFILE

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\AR-01.DWG Scale:1:1 SavedDate:11/27/2018 Time:09:56 Plot Date: Duggan, Katie; 11/27/2018; 18:55 ; Layout:78

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
HEADWALL-WING-NOTES
CGTL8000-XCT

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

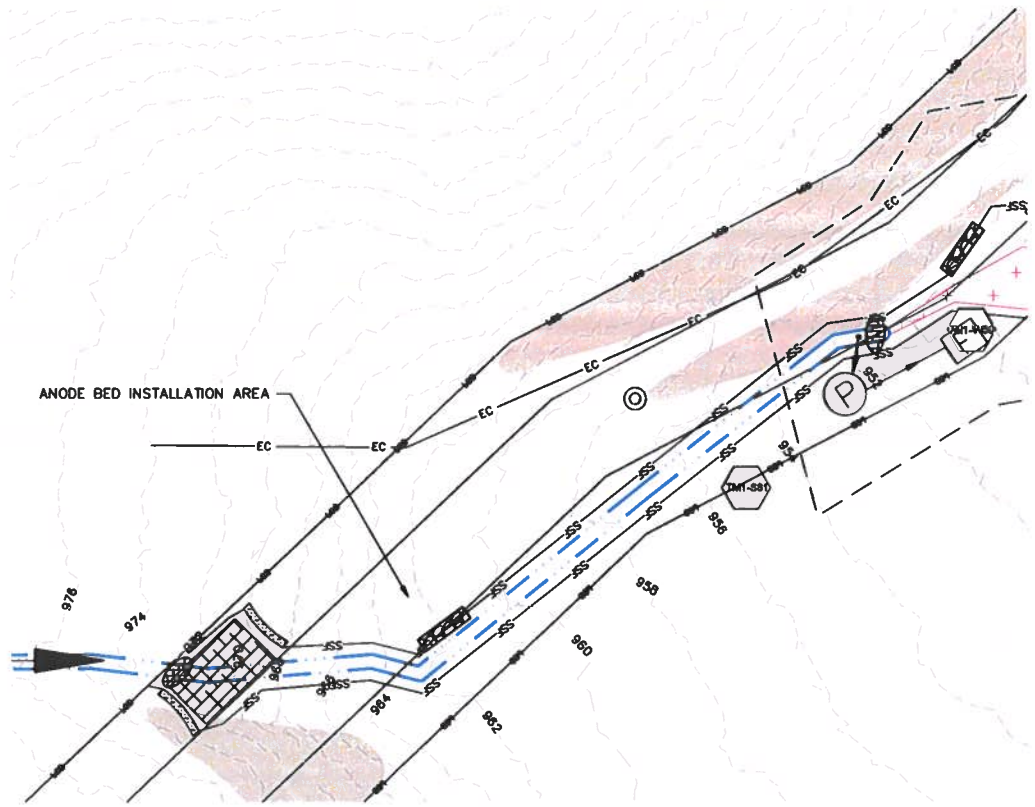
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSINGS TM1-S64

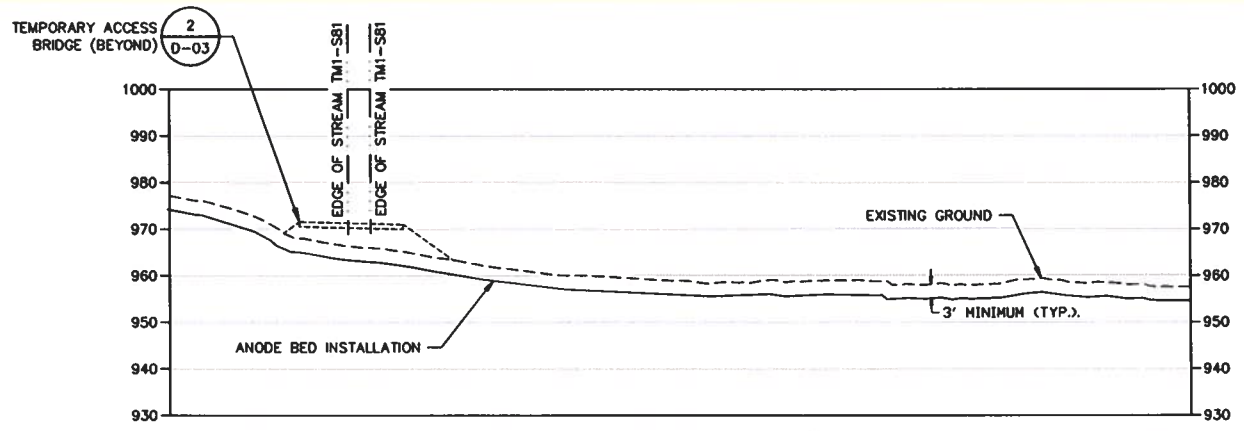
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-01



PLAN



STREAM TM1-S81 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S81 (west diversion)	R4	3	182	546	N/A	N/A	N/A	N/A	1100	N/A	N/A	N/A
TM1-W50	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	527	N/A	3,457

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F — PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03) (1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01) (2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-PL
CGTL8000-GEN-NOTES
CGTL8000-XCT

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

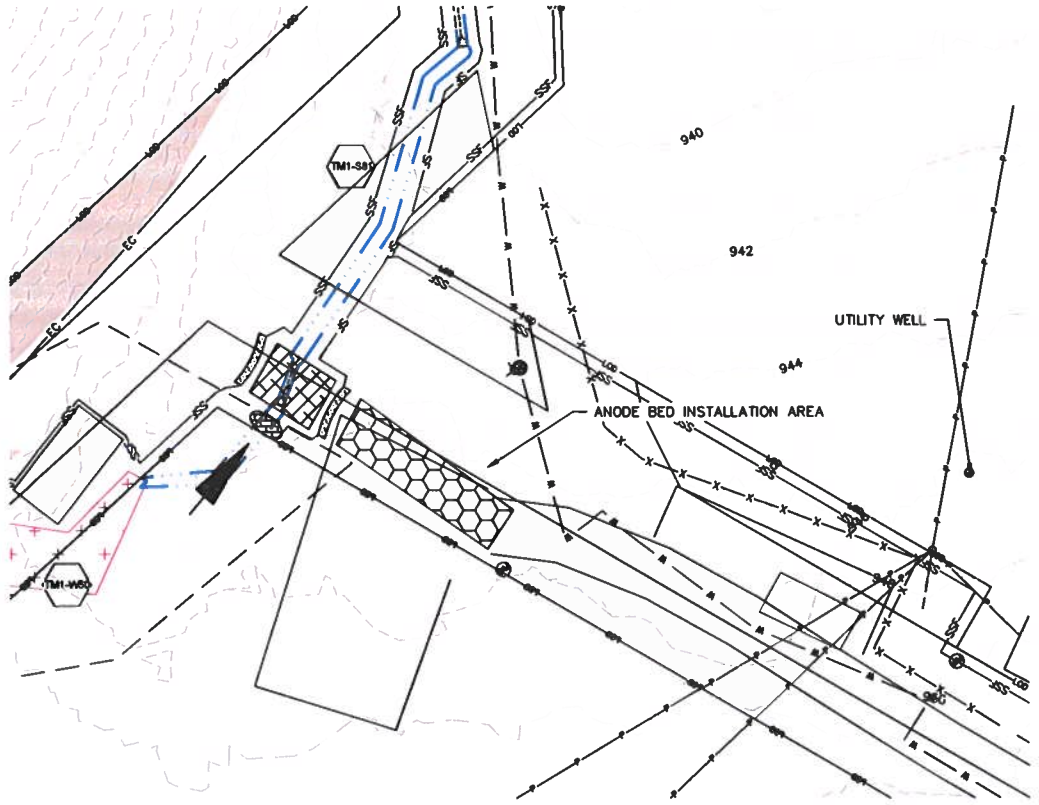
ANODE BED INSTALLATION CROSSINGS TM1-S81 AND TM1-W50

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

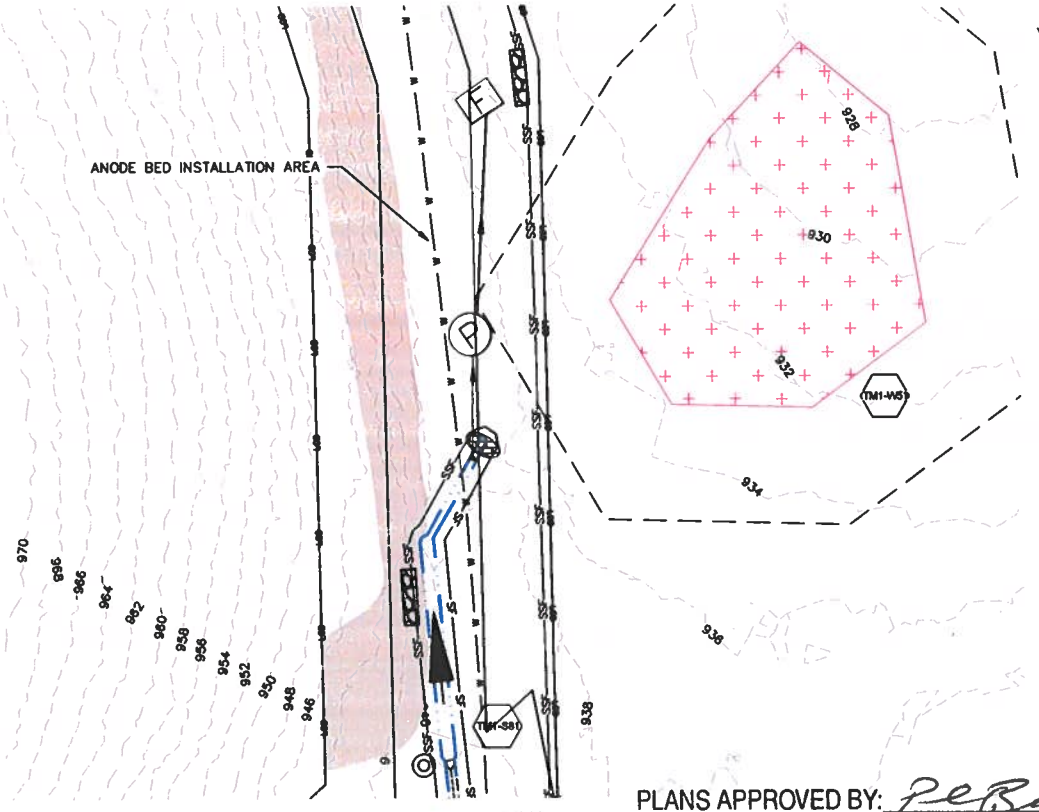
AR-01A

79 OF 94

User:TTITTLE Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\AR-01A.DWG Scale:1:1 SavedDate:11/28/2018 Time:16:04 Plot Date: Hunter, Owen, 11/27/2018, 10:03 ; Layout:79



PLAN

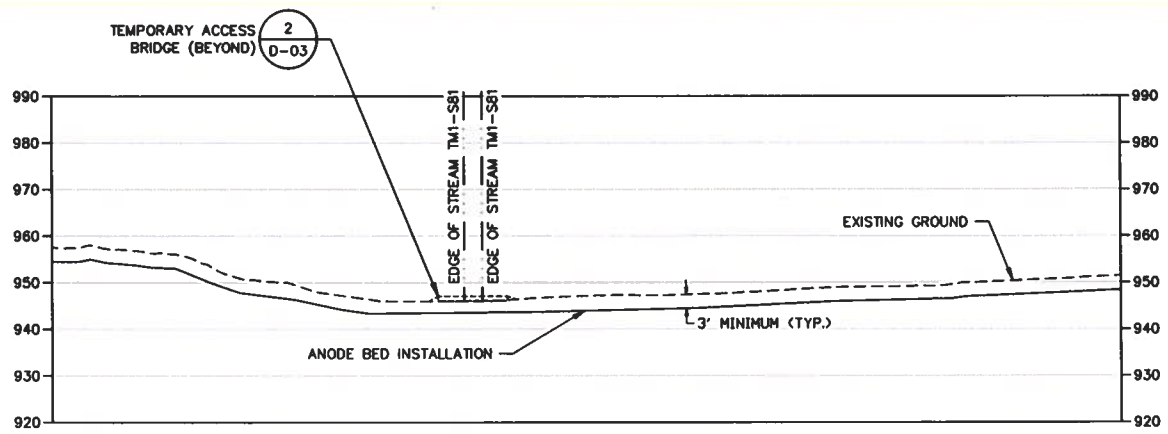


PLAN

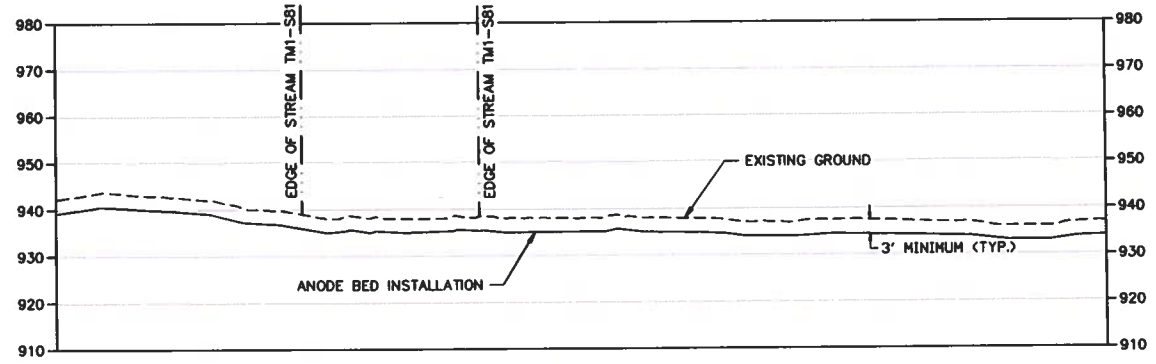
PLANS APPROVED BY: PERu
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

LEGEND (SEE NOTE 2)

- S8 W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED



STREAM TM1-S81 PROFILE



PROFILE

Resource ID	Cowardin Code	Aquatic Resource Crossings: Stream Impacts: Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Floodplain Impacts: Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Wetland Impacts: Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S81 (east diversion)	R4	3	187	561	N/A	N/A	N/A	N/A	1100	N/A	N/A	N/A
TM1-W50	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	527	N/A	3,457
TM1-W51	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	334

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-DETAILS
IMAGES:
HEXAGON KEYNOTES
CGTL8000-XCT

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

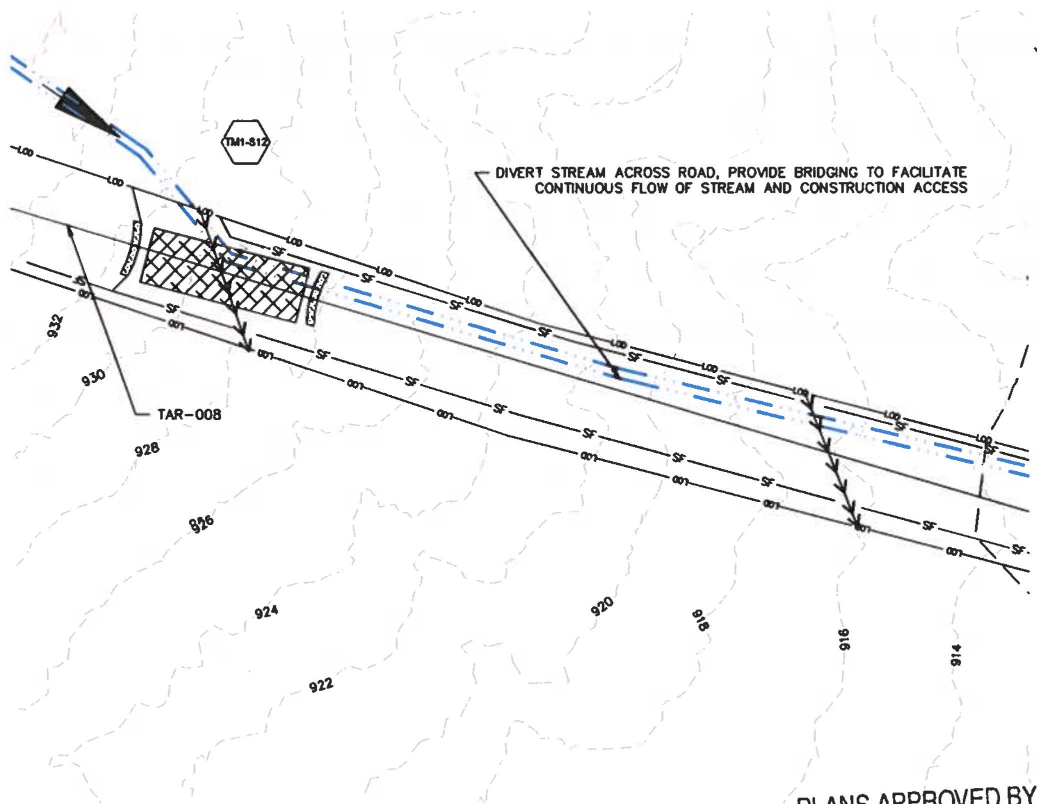
ANODE BED INSTALLATION CROSSINGS TM1-W50 AND TM1-S81

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018

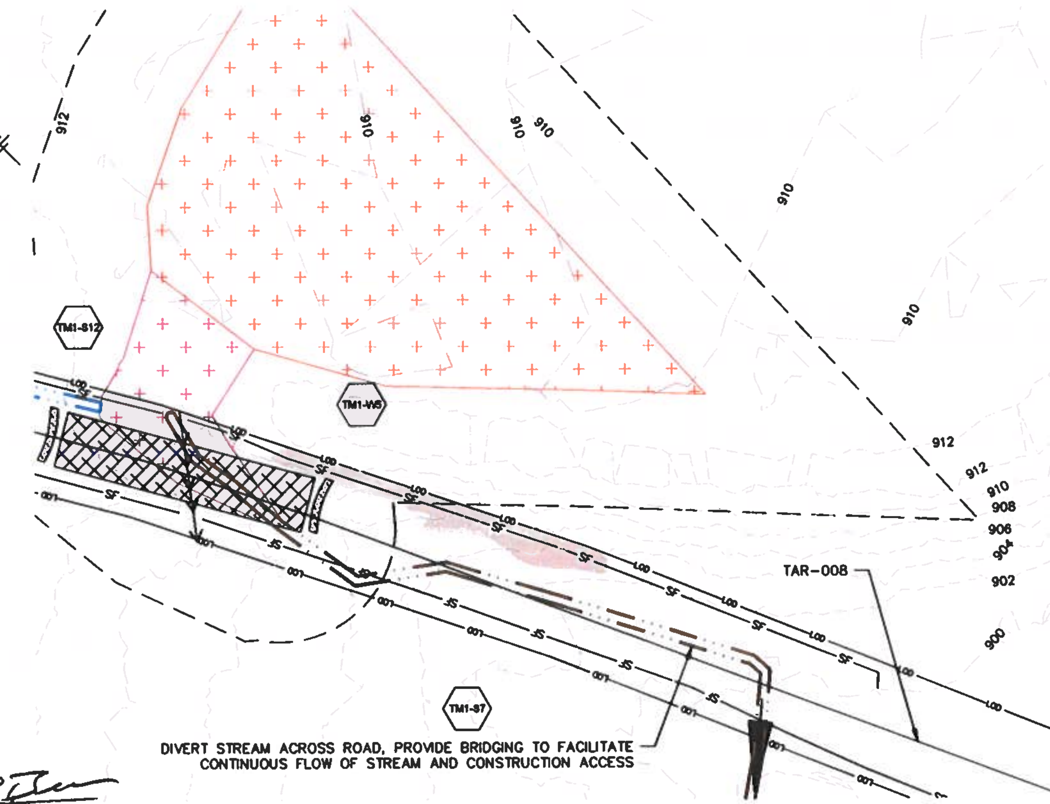
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-02

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\VAR-02.DWG Scale:1:1 SavedDate:11/28/2018 Time:16:04 Plot Date: Hunter, Owen; 11/27/2018; 09:35 ; Layout:80

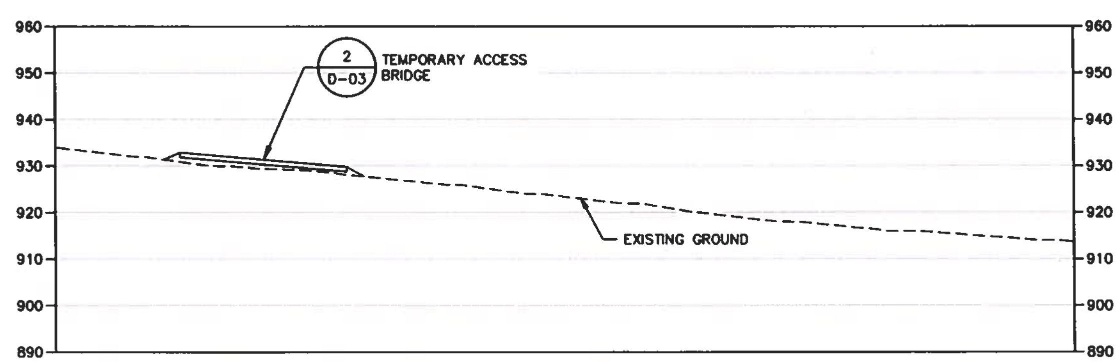


PLAN

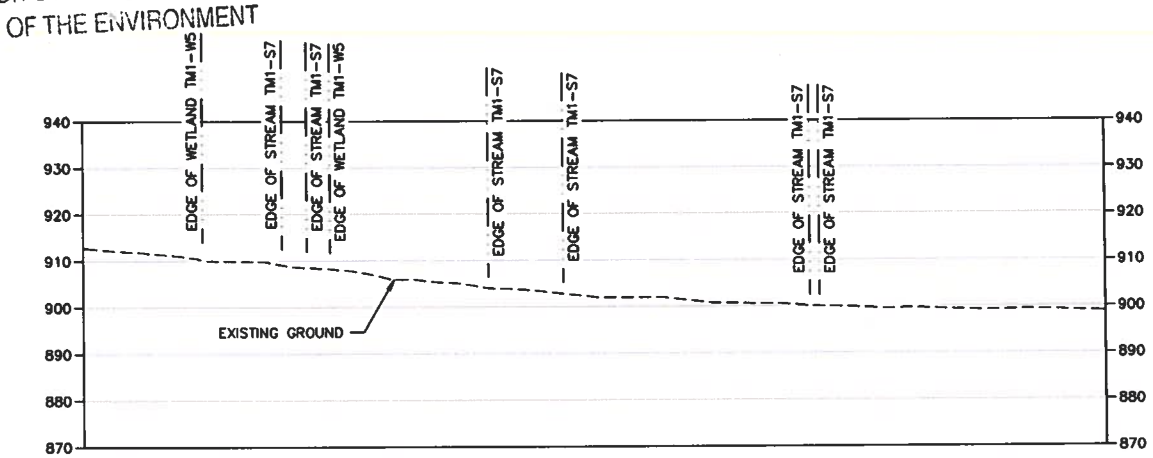


PLAN

PLANS APPROVED BY:
DATE:
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



PROFILE



WETLAND TM1-W5 AND STREAM TM1-S7 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S12	R4	2	62	124	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A
TM1-S7	R6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TM1-W5	PEM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	382	N/A	1,894

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 / D-01)
- SSF — SUPER SILT FENCE (4 / D-01)
- 24 — 24" COMPOST FILTER SOCK (1 / D-07)
- 32 — 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 / D-03)
- TEMPORARY GABION (3 / D-06)
- INTERCEPTOR DIVERSION (1 / D-02)
- TRENCH PLUG (2 / D-02)
- P — F PUMP AND FILTER BAG (3 / D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 / D-03) (1 / D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 / D-01) (2 / D-01)
- SOIL STABILIZATION MATTING (1 / D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 / D-04)
- BROAD-BASED DIP (3 / D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS: CGTL8000-TB-34x22, CGTL8000-LEGEND, CGTL8000-ESC, CGTL8000-XCT, CGTL8000-PL, HEXAGON KEYNOTES
IMAGES:

1"=20' — 20' 0 20' 40'

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

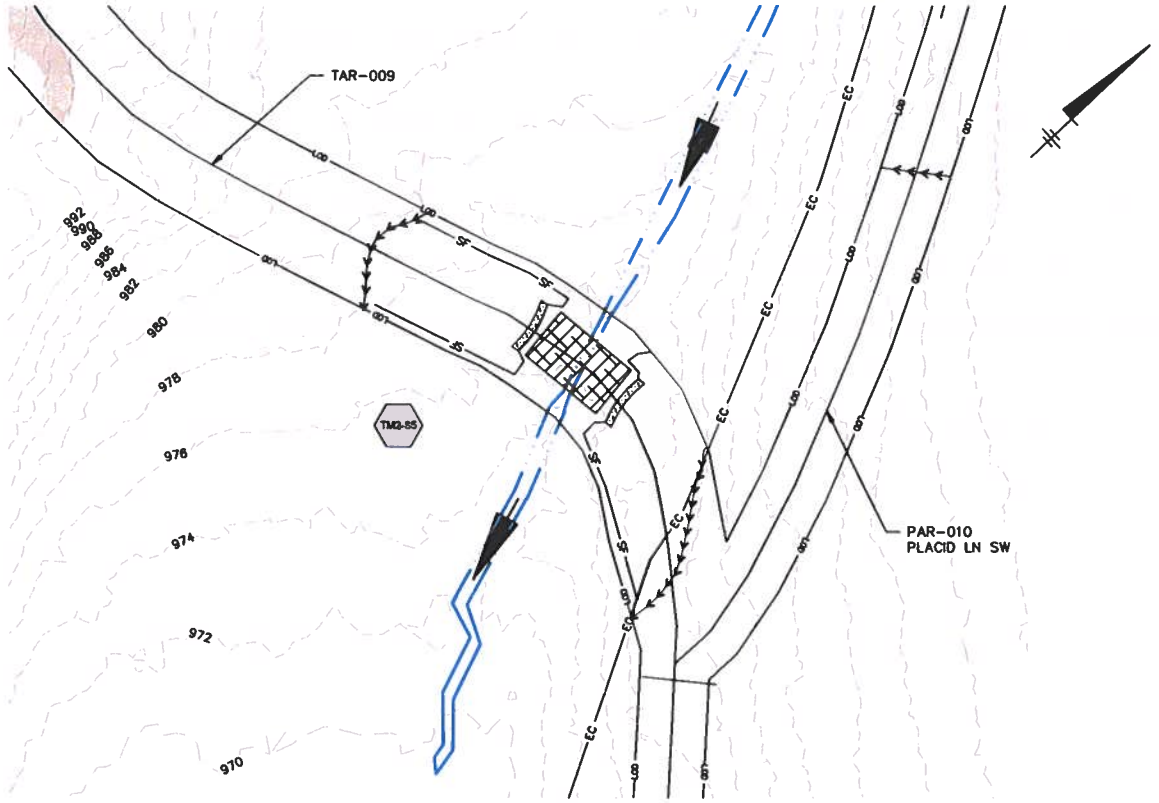
ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

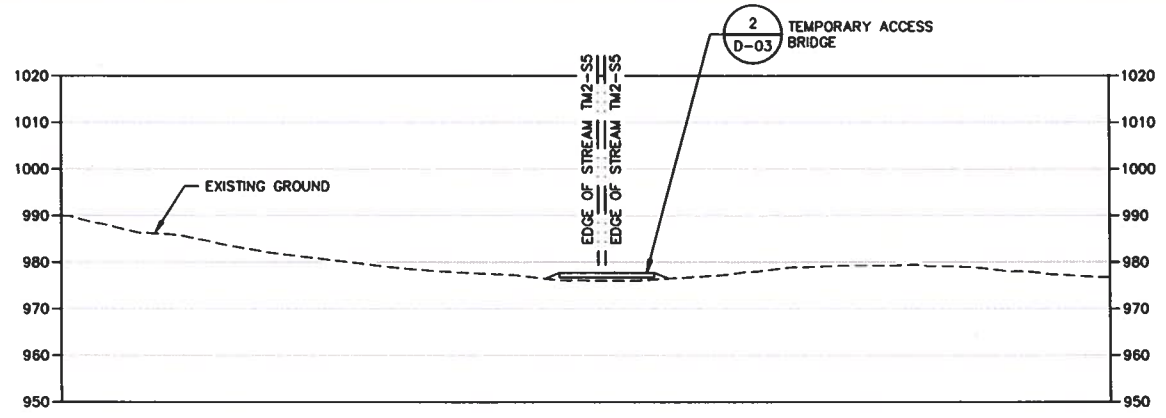
ACCESS ROAD CROSSINGS TM1-S7, TM1-S12 AND TM1-W5

ARCADIS Project No. CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-03



PLAN



STREAM TM2-S5 PROFILE

Aquatic Resource Crossings													
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM2-S5	R4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	400	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R8) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 4/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

IMAGES:
XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC. — Design & Consultancy for natural and built assets

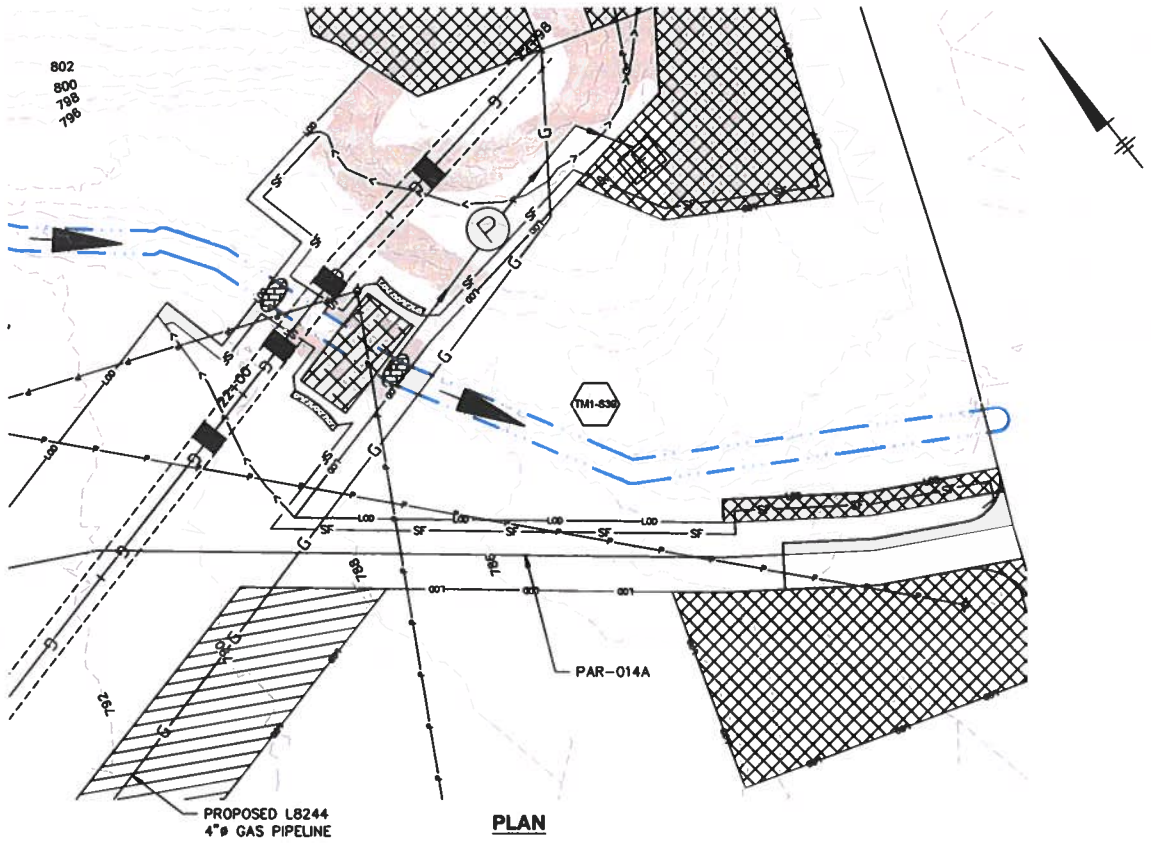
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSING TM2-S5

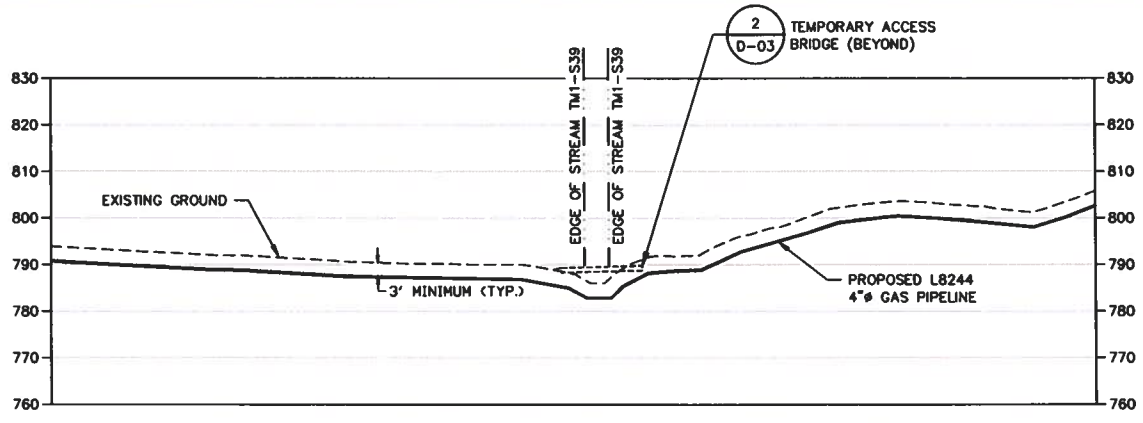
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-04



PLAN



STREAM TM1-S39 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	
TM1-S39	R3	6	35	210	N/A	N/A	N/A	N/A	75	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01, 4/D-01)
- SSF — SUPER SILT FENCE
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F — PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS		
Professional Engineer's No.	MD 52652		
State	Date Signed	Project Mgr.	
MD	11/28/2018	JD	
Designed by	Drawn by	Checked by	
SES	BJJ	MBH	

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

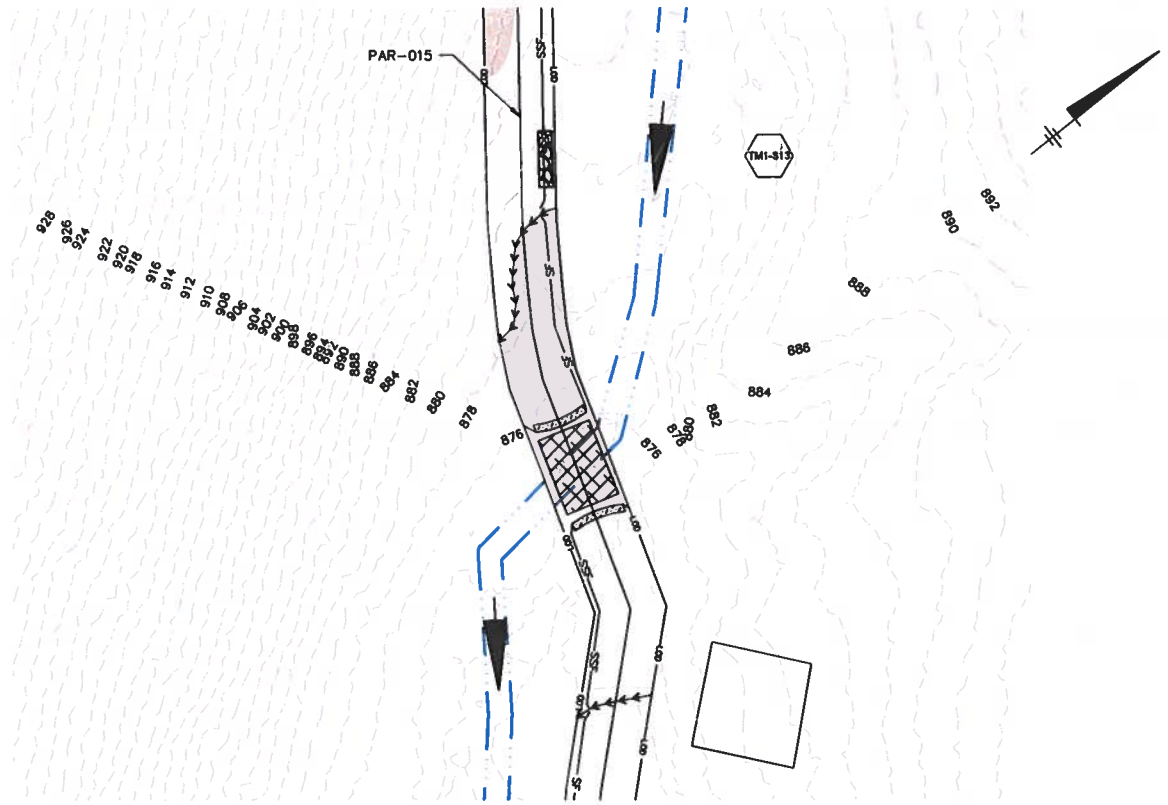
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSING TM1-S39

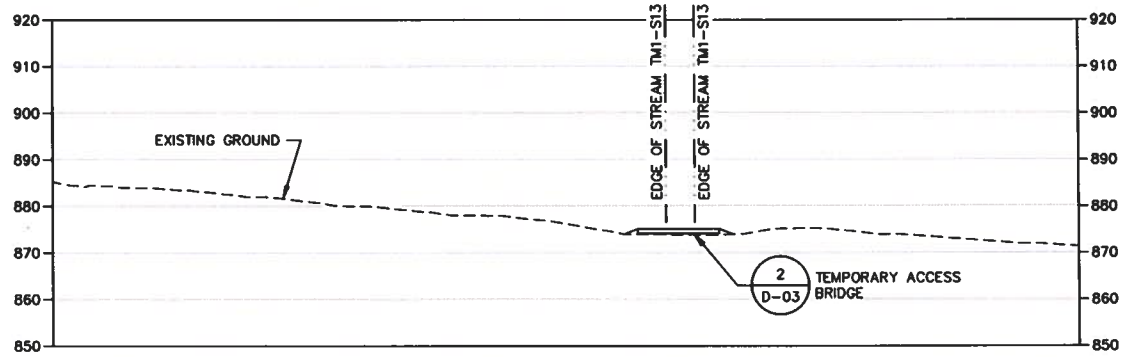
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-05



PLAN



STREAM TM1-S13 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S13	R4	0	0	0	N/A	N/A	N/A	N/A	450	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R5) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: PGR
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

STATE OF MARYLAND — MICHAEL BRIAN HIGGINS — 52652 — PROFESSIONAL ENGINEER

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

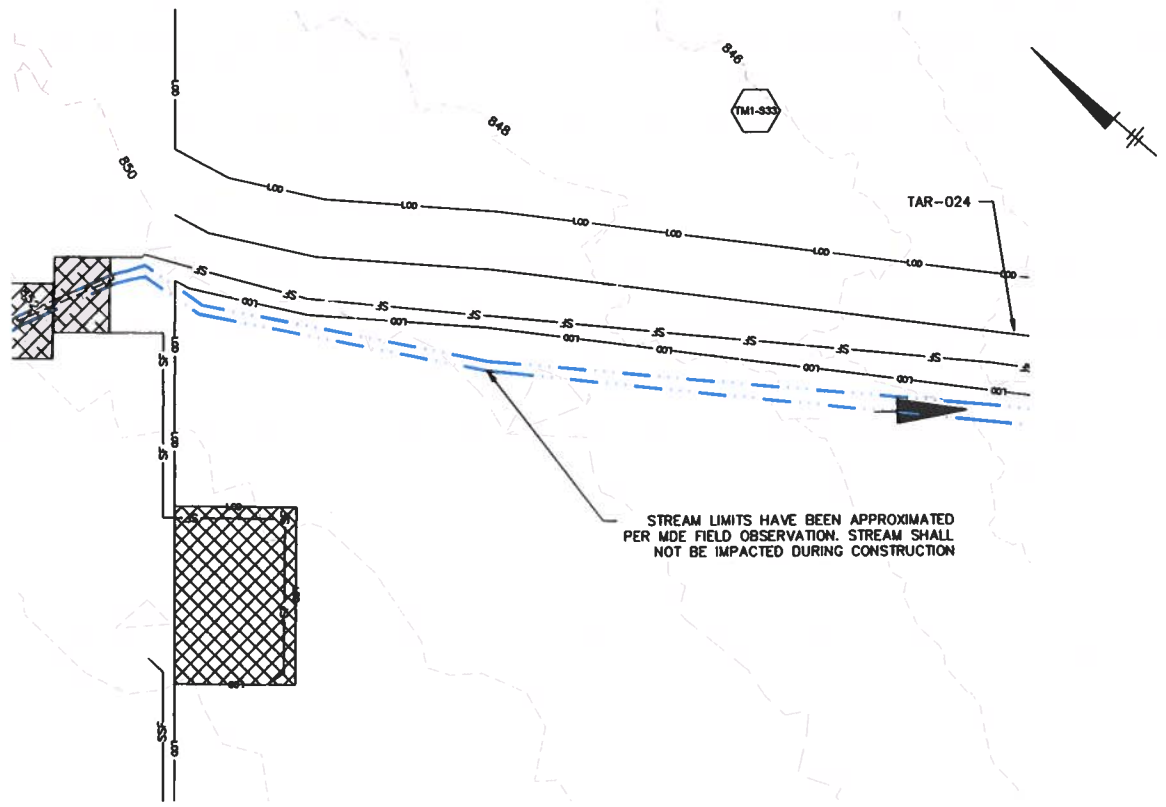
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSING TM1-S13

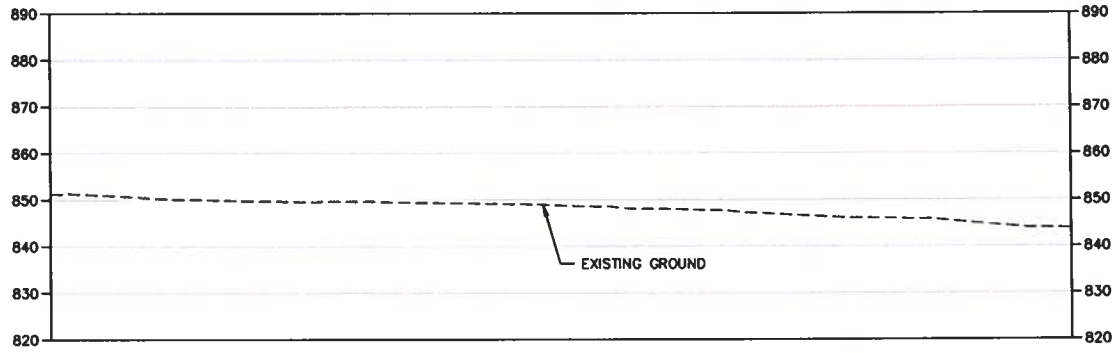
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-06

84 OF 94



PLAN



STREAM TM1-S33 PROFILE

Aquatic Resource Crossings												
		Stream Impacts						Floodplain Impacts		Wetland Impacts		
Resource ID	Cowardin Code	Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S33 (access road crossing)	R4	0	0	0	N/A	N/A	N/A	N/A	1380	N/A	N/A	N/A

Notes:
A. Jurisdictional resources include intermittent (R4) and perennial (R3) streams and all wetland types. Ephemeral (R6) streams are not jurisdictional and therefore no impact was calculated
B. Streams proposed to be crossed for temporary access only will be spanned bank to bank by a timbermat bridge with no impact to bank or stream; therefore, no impact was calculated

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FEET (3/D-01)
- SSF — SUPER SILT FENCE (4/D-01)
- 24" COMPOST FILTER SOCK (1/D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3/D-03)
- TEMPORARY GABION (3/D-06)
- INTERCEPTOR DIVERSION (1/D-02)
- TRENCH PLUG (2/D-02)
- P — F PUMP AND FILTER BAG (3/D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2/D-03, 1/D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1/D-01, 2/D-01)
- SOIL STABILIZATION MATTING (1/D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2/D-04)
- BROAD-BASED DIP (3/D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-XCT
CGTL8000-PL
IMAGES:
HEXAGON KEYNOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

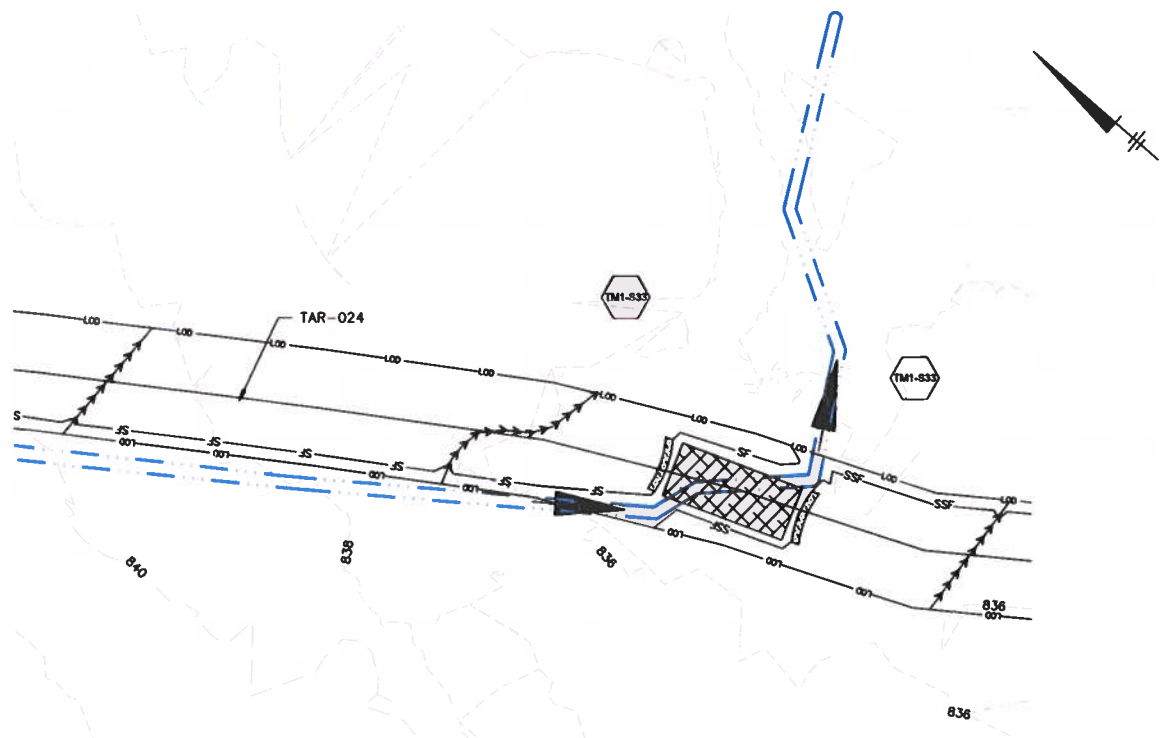
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSING TMI-S33

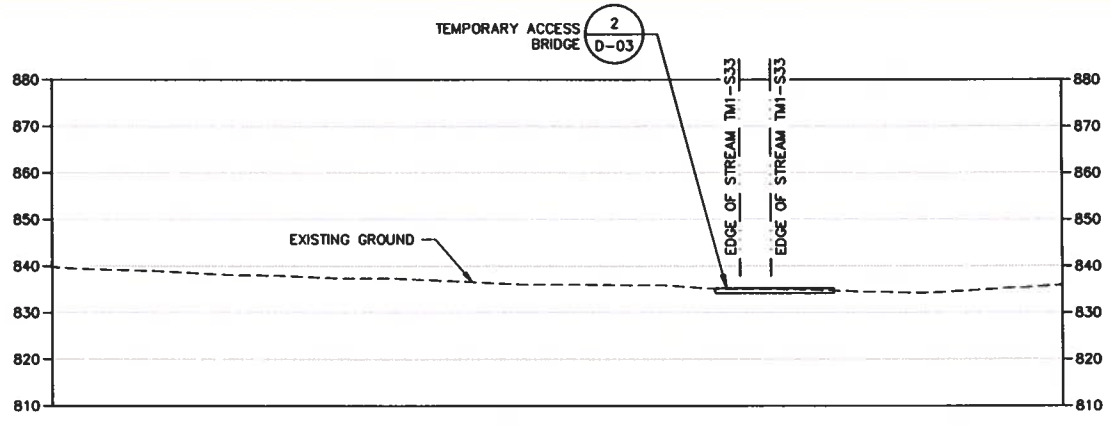
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-08

88 OF 94



PLAN



STREAM TM1-S33 PROFILE

Aquatic Resource Crossings

Resource ID	Cowardin Code	Stream Impacts						Floodplain Impacts		Wetland Impacts		
		Temporary Stream Impact (width)	Temporary Stream Impact (Center)	Temporary Stream Impact (sq ft)	Permanent Stream Impact (width)	Permanent Stream Impact (center)	Permanent Stream Impact (sq ft)	Temporary FEMA 100-yr Floodplain Impact (sq ft)	Temporary MDE Calculated Floodway Impact (sq ft) - See Note 4 on Drawing Sheets	Temporary Wetland Impact (sq ft)	Wetland Conversion (sq ft)	Temporary MDE 25-ft Wetland Buffer Impact (sq ft)
TM1-S33 (access road crossing)	R4	0	0	0	N/A	N/A	N/A	N/A	1380	N/A	N/A	N/A

LEGEND (SEE NOTE 2)

- S8 / W1 — AQUATIC RESOURCE (I.E., STREAM OR WETLAND) ID
- EXISTING STREAM (PERENNIAL OR INTERMITTENT)
- EXISTING STREAM (EPHEMERAL)
- STREAM FLOW DIRECTION
- PSS WETLAND
- PFO WETLAND
- PEM WETLAND
- POW WETLAND
- 25-FOOT NON-TIDAL WETLAND BUFFER
- G — EXISTING GAS TRANSMISSION LINES
- 100+00 G — PROPOSED GAS TRANSMISSION LINE
- EXISTING CULVERT
- LOD — LIMIT OF DISTURBANCE
- TEMPORARY WORK SPACE
- ADDITIONAL TEMPORARY WORK SPACE
- SF — SILT FENCE (3 D-01)
- SSF — SUPER SILT FENCE (4 D-01)
- 24" COMPOST FILTER SOCK (1 D-07)
- 32" COMPOST FILTER SOCK
- SAND BAG DIVERSION (3 D-03)
- TEMPORARY GABION (3 D-06)
- INTERCEPTOR DIVERSION (1 D-02)
- TRENCH PLUG (2 D-02)
- P — F PUMP AND FILTER BAG (3 D-02)
- TEMPORARY ACCESS BRIDGE/TIMBER MATTING (2 D-03, 1 D-04)
- STABILIZED CONSTRUCTION ENTRANCE (WITH WASH RACK AS REQUIRED) (1 D-01, 2 D-01)
- SOIL STABILIZATION MATTING (1 D-03)
- WEIGHTED SEDIMENT FILTER TUBE (2 D-04)
- BROAD-BASED DIP (3 D-04)
- EXISTING GAS TRANSMISSION LINES TO BE REMOVED
- EXISTING GAS TRANSMISSION LINES TO BE ABANDONED IN-PLACE
- EXISTING GAS TRANSMISSION LINES TO BE GROUTED

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES

1. REFER TO DRAWINGS G-01 AND G-02 FOR ADDITIONAL BASEMAP INFORMATION.
2. NOT ALL LEGEND ITEMS MAY APPEAR ON THIS DRAWING.
3. STREAM BYPASS SHALL BE CONDUCTED USING A FLUMED CROSSING IN ACCORDANCE WITH DETAIL 1 ON DRAWING D-06. FLUME PIPING, AT A MINIMUM, SHALL BE SIZED TO ACCOMMODATE BASE FLOW WITHIN THE STREAM AT THE TIME OF THE CONSTRUCTION CROSSING. ALTERNATIVELY, DAM AND PUMP BYPASS THE FLOW IN ACCORDANCE WITH DETAIL 2 ON DRAWING D-06.
4. MARYLAND DEPARTMENT OF THE ENVIRONMENT (MDE) FLOODPLAIN IMPACTS SHOWN IN THE IMPACT TABLES WERE CALCULATED BY MDE AND ARE NOT DEPICTED ON THE DRAWINGS.
5. LOCATION OF BRIDGE CROSSINGS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, HOWEVER DIVERSION TO DIVERSION WIDTH SHALL NOT EXCEED THOSE SHOWN.
6. WHEN WORKING IN EPHEMERAL STREAMS UNDER DRY CONDITIONS, STREAM BYPASS MAY NOT BE NECESSARY. IF THE CONTRACTOR ENCOUNTERS WET CONDITIONS, STREAM BYPASS SHALL BE CONDUCTED AS SHOWN DRAWINGS.

XREFS:
IMAGES:
CGTL8000-TB-34x22
CGTL8000-LEGEND
CGTL8000-ESC
CGTL8000-ACT
CGTL8000-ALL
HEXAGON KEY NOTES

1"=20' (20' 0 20' 40')

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS		
Professional Engineer's No.	MD 52652		
State	Date Signed	Project Mgr.	
MD	11/28/2018	JD	
Designed by	Drawn by	Checked by	
SES	BJJ	MBH	

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

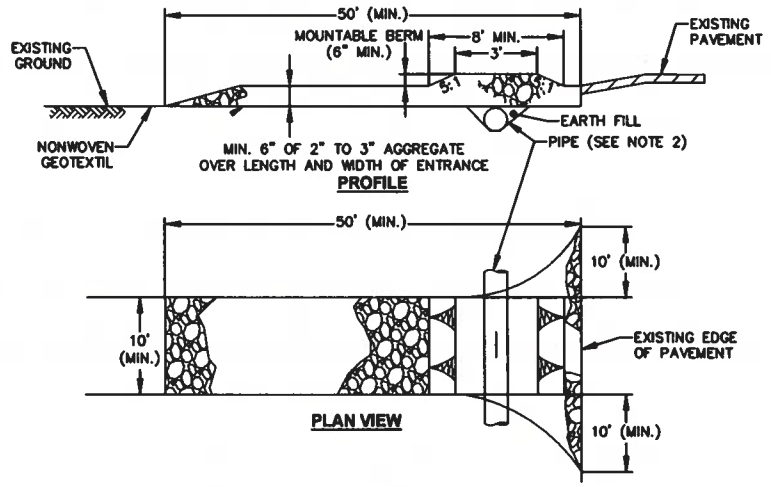
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

ACCESS ROAD CROSSINGS TM1-S33

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

AR-09

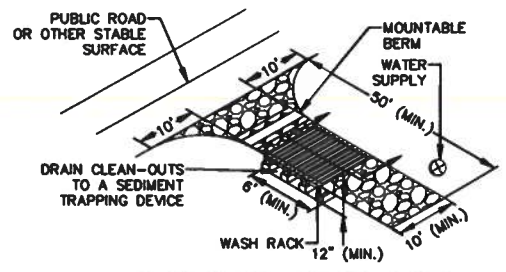


NOTES:

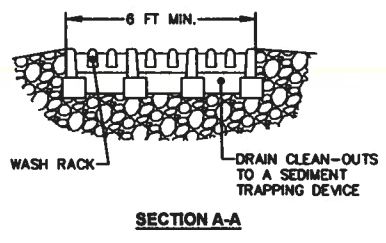
1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET. USE MINIMUM WIDTH OF 10 FEET. FLARE STABILIZED CONSTRUCTION ENTRANCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5H:1V SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE STABILIZED CONSTRUCTION ENTRANCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN STABILIZED CONSTRUCTION ENTRANCE IS NOT LOCATED AT A HIGH SPOT.
3. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE STABILIZED CONSTRUCTION ENTRANCE.
4. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

STABILIZED CONSTRUCTION ENTRANCE (1)

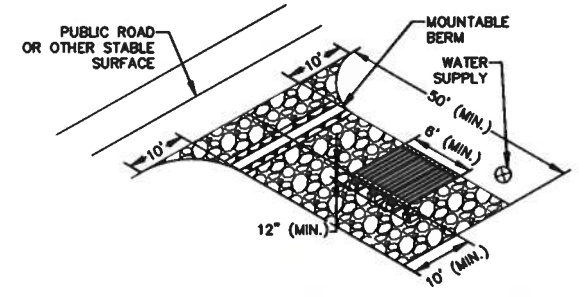
NOT TO SCALE



ISOMETRIC VIEW - WASH RACK IN SCE



SECTION A-A

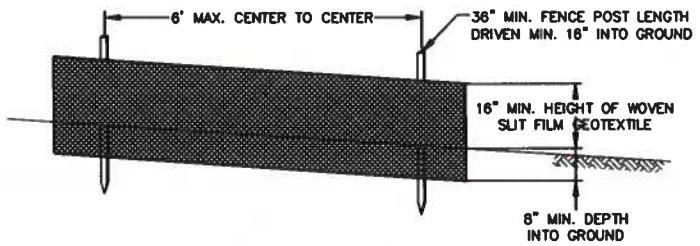


NOTES:

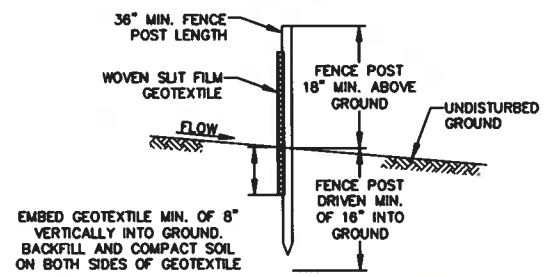
1. USE A WASH RACK DESIGNED AND CONSTRUCTED/MANUFACTURED FOR THE ANTICIPATED TRAFFIC LOADS. CONCRETE, STEEL, OR OTHER MATERIALS ARE ACCEPTABLE. PRE-FABRICATED UNITS SUCH AS CATTLE GUARDS ARE ACCEPTABLE. USE MINIMUM DIMENSION OF 6 FEET BY 10 FEET. ORIENT DIRECTION OF RIBS AS SHOWN ON THE DETAIL.
2. INSTALL PRIOR TO, ALONG SIDE OF, OR AS PART OF THE STABILIZED CONSTRUCTION ENTRANCE.
3. DIRECT WASH WATER TO AN APPROVED SEDIMENT TRAPPING DEVICE.
4. KEEP AREA UNDER WASH RACK FREE OF ACCUMULATED SEDIMENT. IF DAMAGED, REPAIR OR REPLACE WASH RACK.

WASH RACK OPTION (2)

NOT TO SCALE



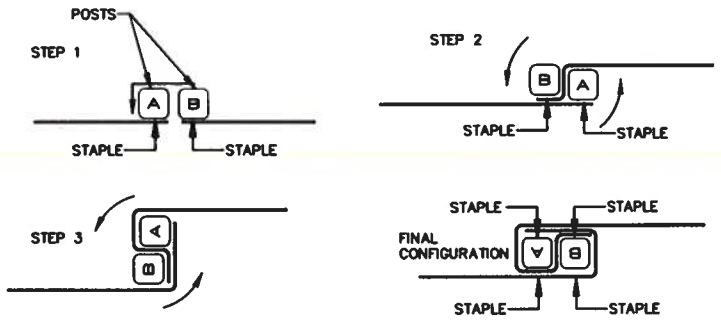
ELEVATION



CROSS SECTION

GEOTEXTILE FABRICS							
PROPERTY	TEST METHOD	WOVEN SLIT FILM GEOTEXTILE		WOVEN NONFILAMENT GEOTEXTILE		NONWOVEN GEOTEXTILE	
		MINIMUM AVERAGE ROLL VALUE					
		MD	CD	MD	CD	MD	CD
GRAB TENSILE STRENGTH	ASTM D-4632	200 LBS	200 LBS	370 LBS	250 LBS	200 LBS	200 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	15%	10%	15%	15%	50%	50%
TRAPEZOIDAL TEAR STRENGTH	ASTM D-4533	75 LBS	75 LBS	100 LBS	60 LBS	80 LBS	80 LBS
PUNCTURE STRENGTH	ASTM D-6241	450 LBS		900 LBS		450 LBS	
APPARENT OPENING SIZE	ASTM D-4751	U.S. SIEVE 30 (0.59 MM)		U.S. SIEVE 70 (0.21 MM)		U.S. SIEVE 70 (0.21 MM)	
PERMITTIVITY	ASTM D-4491	0.05/SEC		0.28/SEC		1.1/SEC	
ULTRAVIOLET RESISTANCE RETAINED AT 500 HOURS	ASTM D-4355	70% STRENGTH		70% STRENGTH		70% STRENGTH	

PLANS APPROVED BY: [signature]
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



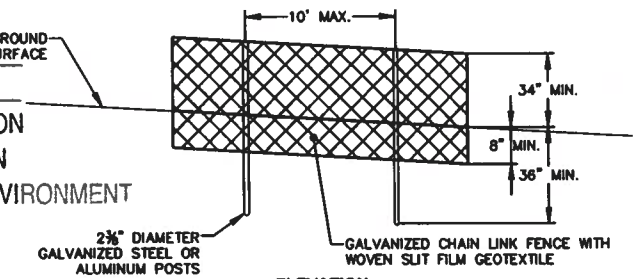
JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

NOTES:

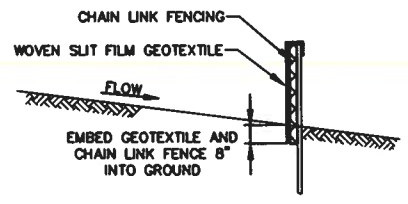
1. USE WOOD POSTS 1 3/4" BY 1 3/4" ± 1/16" (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS OF THIS DETAIL.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

SILT FENCE (3)

NOT TO SCALE



ELEVATION



CROSS SECTION

NOTES:

1. INSTALL 2 3/8" DIAMETER GALVANIZED STEEL POSTS OF 0.095" WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 3/8" MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS OF THIS DETAIL.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

SUPER SILT FENCE (4)

NOT TO SCALE

XREFS:
IMAGES:
CGTL8000-TB-34x22

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name	MICHAEL B. HIGGINS	
Professional Engineer's No.	MD 52652	
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

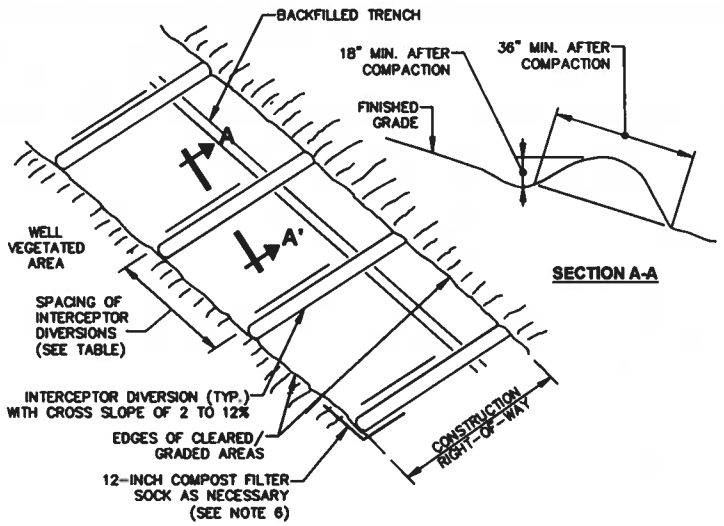
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
60 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-01



PLAN

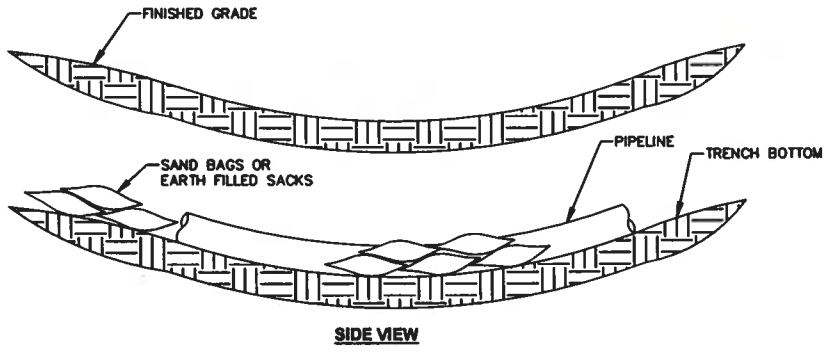
MINIMUM SPACING FOR INTERCEPTOR DIVERSIONS (SEE NOTE 1)	
PERCENT SLOPE	SPACING (FT.)
0–5	NONE
5–15	300
15–30	200
>30	100

NOTES:

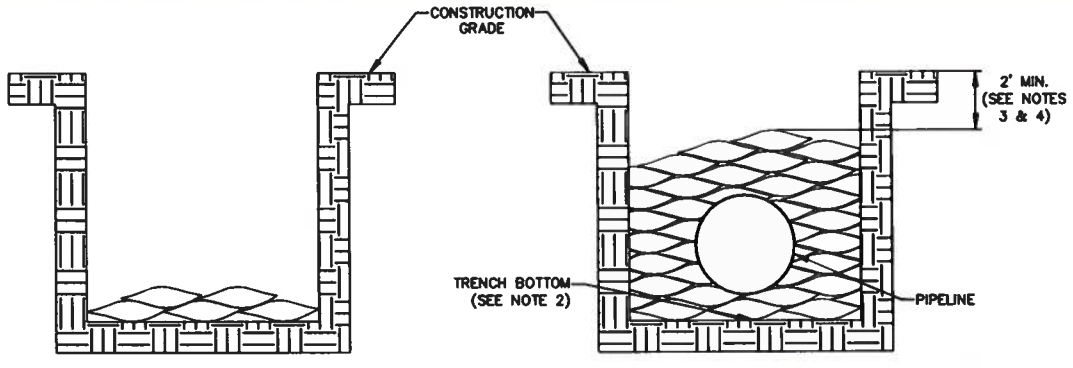
1. MINIMUM SPACING SPECIFIED FOR BOTH TEMPORARY AND PERMANENT INTERCEPTOR DIVERSIONS.
2. INTERCEPTOR DIVERSIONS SHALL DISCHARGE TO A WELL VEGETATED, STABLE AREA.
3. INTERCEPTOR DIVERSIONS SHALL BE INSPECTED WEEKLY (DAILY ON ACTIVE ROADS) AND AFTER EACH RUNOFF EVENT. DAMAGED OR ERODED WATERBARS SHALL BE RESTORED TO ORIGINAL DIMENSIONS WITHIN 24 HOURS OF INSPECTION.
4. MAINTENANCE OF INTERCEPTOR DIVERSIONS SHALL BE PROVIDED UNTIL RIGHT-OF-WAY HAS ACHIEVED PERMANENT STABILIZATION. INTERCEPTOR DIVERSIONS IN AGRICULTURAL AND RESIDENTIAL AREAS SHALL BE REMOVED DURING FINAL RESTORATION.
5. INTERCEPTOR DIVERSIONS MUST BE INSTALLED WITHIN ALL CLEARED AREAS AT THE LOCATIONS IDENTIFIED ON THESE DRAWINGS BY THE END OF THE WORK DAY.
6. 12-INCH COMPOST FILTER SOCK J-HOOK SHALL BE INSTALLED AT THE OUTLETS OF THE INTERCEPTOR DIVERSIONS, WHERE A WELL VEGETATED AREA IS NOT AVAILABLE AND/OR ADJACENT TO SURFACE WATERS.
7. DIVERSION OUTLETS WILL ALTERNATE FROM SIDE TO SIDE WHENEVER POSSIBLE.

INTERCEPTOR DIVERSION (1)

NOT TO SCALE



SIDE VIEW



BEFORE PIPELINE INSTALLATION

AFTER PIPELINE INSTALLATION

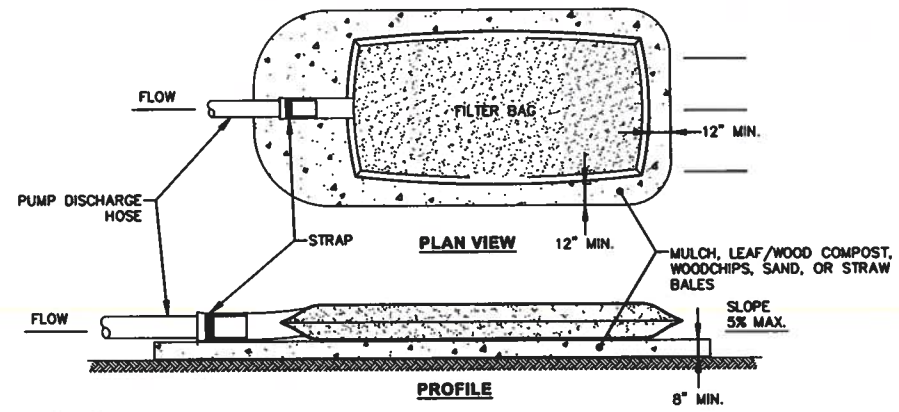
NOTES:

1. PROMPTLY INSTALL TRENCH PLUG AT EVERY SECOND INTERCEPTOR DIVERSION AS TRENCH IS COMPLETED.
2. PRIOR TO LOWERING PIPELINE INTO THE TRENCH, REMOVE ALL DECOMPOSED MATERIAL AND ROCKS FROM THE TRENCH BOTTOM.
3. INSTALL SAND BAGS OR EARTH FILLED SACKS TO TOP OF TRENCH ON STEEP SLOPES GREATER THAN 3H:1V IN NON-AGRICULTURAL AREAS.
4. TOP OF TRENCH PLUG SHALL BE A MINIMUM OF 2 FEET BELOW THE CONSTRUCTION GRADE IN AGRICULTURAL AREAS TO PROVIDE CLEARANCE FOR PLOWING.

TRENCH PLUG (2)

NOT TO SCALE

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



NOTES:

1. TIGHTLY SEAL SLEEVE AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE.
2. PLACE FILTER BAG ON SUITABLE BASE (E.G., MULCH, LEAF/WOOD COMPOST, WOODCHIPS, SAND, OR STRAW BALES) LOCATED ON A LEVEL OR 5% MAXIMUM SLOPING SURFACE. DISCHARGE TO A STABILIZED AREA. EXTEND BASE A MINIMUM OF 12 INCHES FROM EDGES OF BAG.
3. CONTROL PUMPING RATE TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG IN ACCORDANCE WITH THE MANUFACTURER RECOMMENDATIONS. AS THE BAG FILLS WITH SEDIMENT, REDUCE PUMPING RATE.
4. REMOVE AND PROPERLY DISPOSE OF FILTER BAG UPON COMPLETION OF PUMPING OPERATIONS OR AFTER BAG HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. SPREAD THE DEWATERED SEDIMENT FROM THE BAG IN AN APPROVED UPLAND AREA AND STABILIZE WITH SEED AND MULCH BY THE END OF THE WORK DAY. RESTORE THE SURFACE AREA BENEATH THE BAG TO ORIGINAL CONDITION UPON REMOVAL OF THE DEVICE.
5. USE NONWOVEN GEOTEXTILE WITH DOUBLE STITCHED SEAMS USING HIGH STRENGTH THREAD. SIZE SLEEVE TO ACCOMMODATE A MAXIMUM 4-INCH DIAMETER PUMP DISCHARGE HOSE. THE BAG MUST BE MANUFACTURED FROM A NONWOVEN GEOTEXTILE THAT MEETS OR EXCEEDS MINIMUM AVERAGE ROLL VALUES (MARV) FOR THE FOLLOWING:

GRAB TENSILE	250 LB	ASTM D-4632
PUNCTURE	150 LB	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT²	ASTM D-4491
PERMITTIVITY (SEC-1/)	1.2 SEC-1/	ASTM D-4491
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 MM	ASTM D-4751
SEAM STRENGTH	90%	ASTM D-4632

6. REPLACE FILTER BAG IF BAG CLOGS OR HAS RIPS, TEARS, OR PUNCTURES. DURING OPERATION KEEP CONNECTION BETWEEN PUMP HOSE AND FILTER BAG WATER TIGHT. REPLACE BEDDING IF IT BECOMES DISPLACED.

FILTER BAG (3)

NOT TO SCALE

XREFS:
IMAGES:
CGTL8000-TB-34x22

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52852

State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

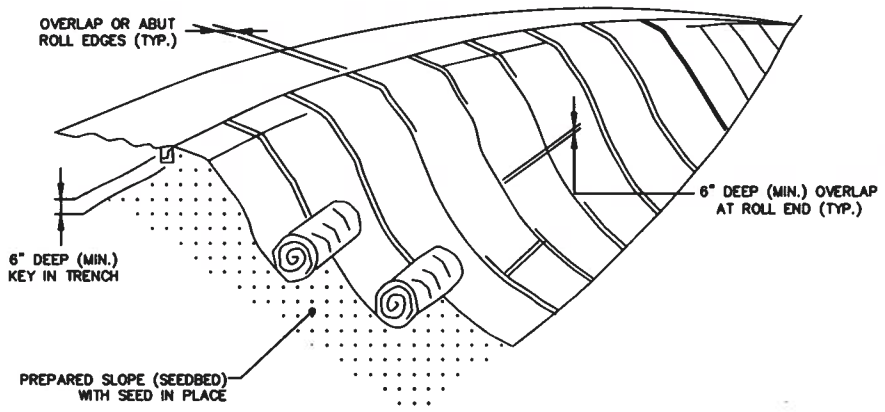
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-02

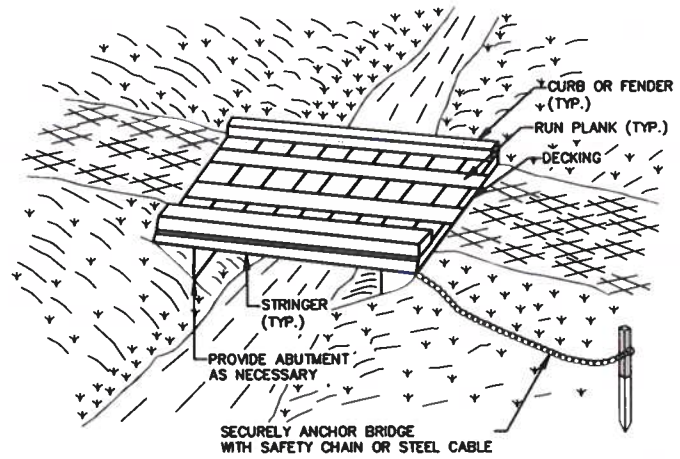


NOTES:

1. USE TEMPORARY SOIL STABILIZATION MATTING MADE OF DEGRADABLE (LASTS 6 MONTHS MINIMUM) NATURAL OR MAN-MADE FIBERS (MOSTLY ORGANIC). MAT MUST HAVE UNIFORM THICKNESS AND DISTRIBUTION OF FIBERS THROUGHOUT AND BE SMOLDER RESISTANT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2X2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
2. SECURE MATTING USING STEEL STAPLES, WOOD STAKES, OR BIODEGRADABLE EQUIVALENT. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND A MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1 BY 3 INCH IN CROSS SECTION, AND WEDGE SHAPED AT THE BOTTOM.
3. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION & SEDIMENT CONTROL PLAN.
4. UNROLL MATTING DOWNSLOPE. LAY MAT SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
5. OVERLAP OR ABUT ROLL EDGES PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSLOPE MAT OVERLAPPING ON TOP OF THE DOWNSLOPE MAT.
6. KEY IN THE UPSLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
7. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
8. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION OF THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

SOIL STABILIZATION MATTING (1)

NOT TO SCALE



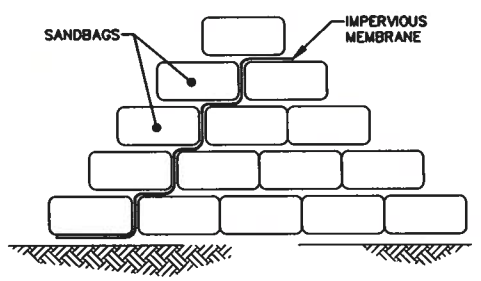
NOTES:

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR DRIVEN STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND\OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD, UNLESS THE CROSSING CAN BE REMOVED WITHOUT IMPACTING THE STREAM OR BANKS, IN THIS CASE IT MAY BE REMOVED WITHIN THE TIME OF YEAR RESTRICTION. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEANUP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.
12. TEMPORARY CROSSINGS SHALL BE MADE FROM SUITABLE MATERIALS (I.E., STEEL PLATE, TIMBER MATTING).

TEMPORARY ACCESS BRIDGE (2)

NOT TO SCALE

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



NOTES:

1. TWO BAG MINIMUM HEIGHT ABOVE NORMAL BASE FLOW.
2. A TEMPORARY COFFERDAM, AS MUNUFACTURED BY AQUA-BARRIER® OR SIMILAR, MAY BE USED IN PLACE OF SANDBAG DIVERSION DAM.

SANDBAG DIVERSION DAM (3)

NOT TO SCALE

XREFs: CGTL8000-TB-34x22
IMAGES:

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name: MICHAEL B. HIGGINS		
Professional Engineer's No.: MD 52652		
State: MD	Date Signed: 11/28/2018	Project Mgr.: JD
Designed by: SES	Drawn by: BJJ	Checked by: MBH

ARCADIS U.S., INC.

COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

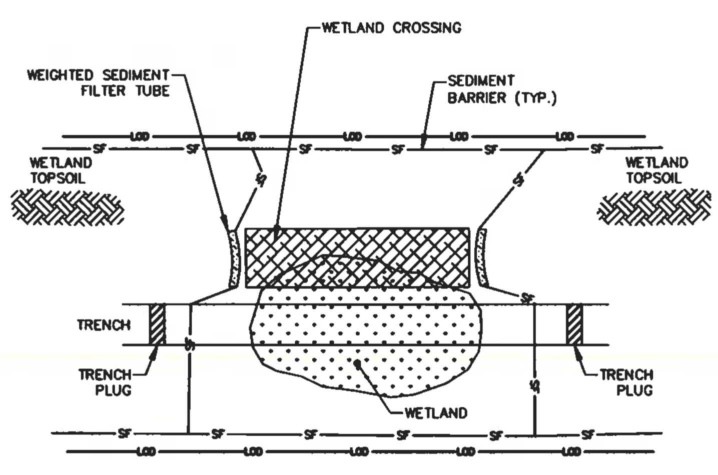
DETAILS

ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-03

User:KDUGGAN Spec:AUS-NCSMOD File:G:\CADD\ACAD\PROJ\CGTL8000.0001 - LINE 8000\SHEETS\CROSSINGS\D-04.DWG Scale:1:1 SavedDate:11/27/2018 Time:08:10 Plot Date: Hunter, Owen; 11/27/2018; 19:12 ; Layout:91
XREFS: CGTL8000-TB-34x22 IMAGES:



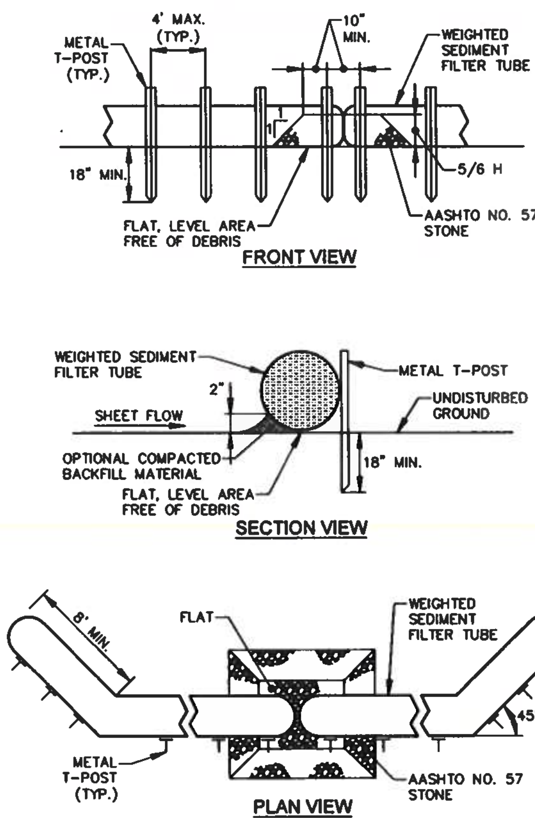
TYPICAL WETLAND CROSSING

NOTES:

1. STAGING AREAS SHALL BE LOCATED AT LEAST 50 FEET FROM THE EDGE OF THE WETLAND.
2. SEDIMENT BARRIERS SHALL BE INSTALLED AS SHOWN ON THE PLAN DRAWINGS.
3. DISTURBANCE FOR WETLAND CROSSINGS WILL BE LIMITED TO THE MINIMUM IMPACT NEEDED FOR PIPELINE INSTALLATION.
4. THE MOVEMENT OF VEHICLES ACROSS THE WETLAND WILL BE MINIMIZED IF SOFT SOILS ARE ENCOUNTERED IN THE WETLAND AREA. THE USE OF TIMBER PADS/MATS WILL BE USED TO SUPPORT THE MOVEMENT OF EQUIPMENT AND/OR VEHICLES.
5. EXCAVATED UPPER MOST 1 FOOT OF TOPSOIL (WITH THE VEGETATIVE ROOT MASS) WILL BE CAREFULLY REMOVED AND STOCKPILED SEPARATELY FROM THE SUBSOIL, UNLESS THERE IS STANDING WATER OR THE SOIL IS TOO SATURATED TO SEGREGATE.
6. TRENCH PLUGS WILL BE INSTALLED WHERE SHOWN TO PREVENT THE PIPELINE TRENCH FROM DRAINING THE WETLANDS OR CHANGING ITS HYDROLOGY.
7. UPSLOPE RUNOFF WILL BE DIVERTED AROUND THE WORK AREA BY THE USE OF INTERCEPTOR DIVERSIONS, WHERE INDICATED.

WETLAND CROSSING (1)

NOT TO SCALE



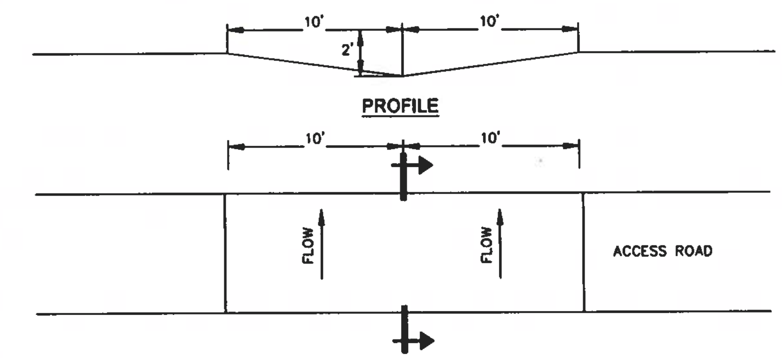
NOTES:

1. A SEDIMENT TUBE PLACEMENT AREA SHALL BE PREPARED SO THAT IT IS FREE OF ALL DEBRIS, INCLUDING ROCKS, STICKS, ROOTS, ETC. A 2" LAYER OF AASHTO #57 STONE SHALL BE PLACED WHERE THE TUBES COME TOGETHER. ENDS OF TUBES MAY BE OVERLAPPED ACCORDING TO MANUFACTURER'S SPECIFICATIONS INSTEAD OF THE AASHTO #57 STONE.
2. SEDIMENT TUBES SHALL BE PLACED AT EXISTING LEVEL GRADE. ENDS SHALL BE EXTENDED UPSLOPE AT 45 DEGREES TO THE MAIN SEDIMENT TUBE ALIGNMENT FOR A MINIMUM OF 8 FEET.
3. SEDIMENT TUBES SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT.
4. SEDIMENT DEPOSITS SHALL BE CLEANED FROM THE TUBE WHEN IT REACHES HALF THE HEIGHT OF THE TUBE.
5. DAMAGED TUBES SHALL BE REPLACED WITHIN 24 HOURS OF INSPECTION. A SUPPLY OF TUBES SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE.

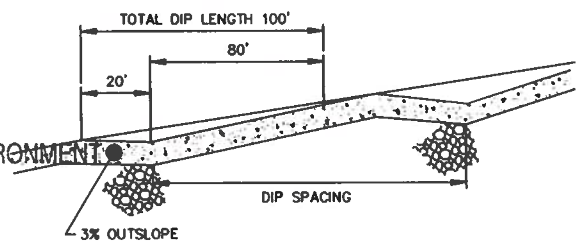
WEIGHTED SEDIMENT FILTER TUBE (2)

NOT TO SCALE

PLANS APPROVED BY: PRTS
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



FOR LOW GRADIENT (≤ 5% ROADWAYS)



FOR HIGH GRADIENT (≤ -10% ROADWAYS)

NOTES:

1. BROAD-BASED DIPS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN AND AT THE LOCATIONS SHOWN ON THESE DRAWINGS.
2. DIPS SHALL BE ORIENTED SO AS TO DISCHARGE TO THE LOW SIDE OF THE ROADWAY.
3. DIPS SHALL BE INSPECTED DAILY. DAMAGED OR NON-FUNCTIONING DIPS SHALL BE REPAIRED BY THE END OF THE WORKDAY.
4. 12-INCH COMPOST FILTER SOCK J-HOOK SHALL BE INSTALLED AT THE OUTLETS OF THE INTERCEPTOR DIVERSIONS, WHERE A WELL VEGETATED AREA IS NOT AVAILABLE AND/OR ADJACENT TO SURFACE WATERS.
5. MAXIMUM SPACING OF BROAD-BASED DIPS IS SHOWN IN TABLE 1.

TABLE 1 - MAXIMUM SPACING OF BROAD-BASED DIPS

ROAD GRADE (PERCENT)	SPACING (FEET)
<2	300
3	235
4	200
5	180
6	165
7	155
8	150
9	145
10	140

BROAD-BASED DIP (3)

NOT TO SCALE

NOT TO SCALE	No.	Date	Revisions	By	Ckd
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE	THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME.				

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS | Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

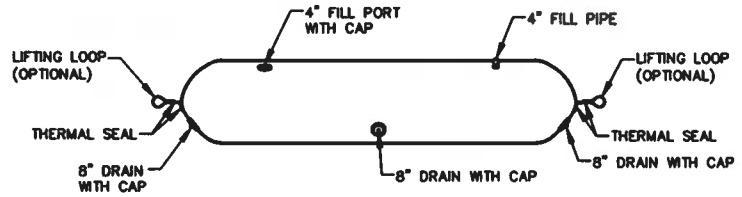
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

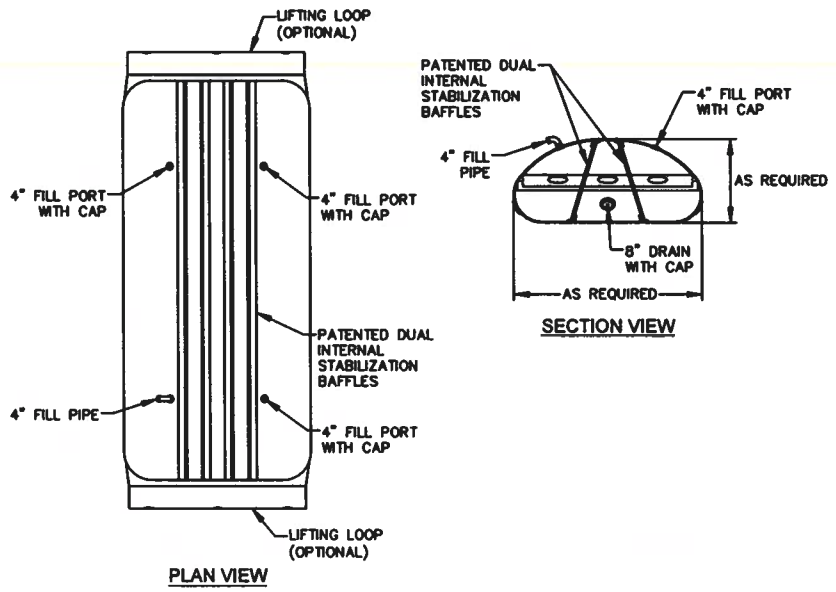
ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018
ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-04

91 OF 94



FRONT VIEW



PLAN VIEW

SECTION VIEW

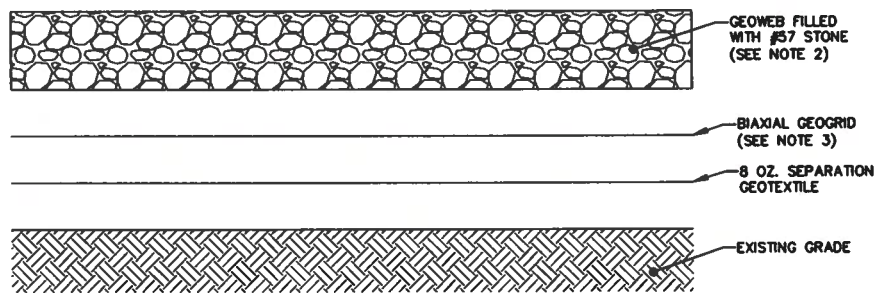
NOTE:

1. AQUA-BARRIER® SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION GUIDELINES.

AQUA-BARRIER® 1

NOT TO SCALE

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

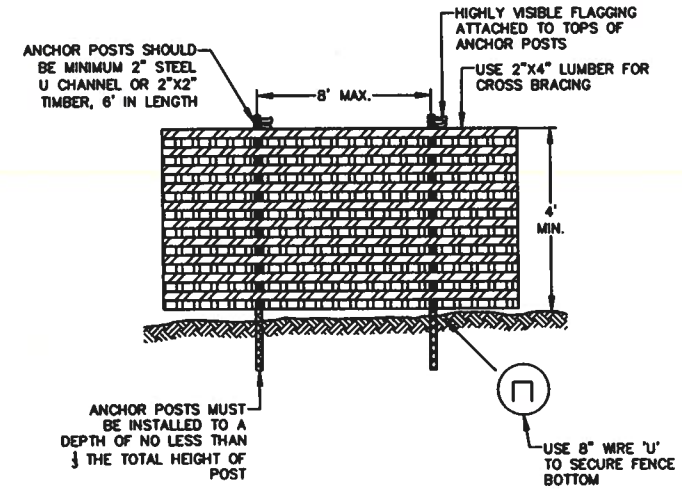


NOTES:

1. NEW PERMANENT ACCESS ROADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THIS DETAIL TO PROVIDE A PERVIOUS SURFACE FOR STORMWATER INFILTRATION AND STABILITY FOR EQUIPMENT TRAVEL.
2. GEOWEB SHALL BE STRATA 356 (8-INCH PROFILE) OR SIMILAR.
3. GEOGRID SHALL BE STRATA BASE 12 OR SIMILAR.
4. EXISTING GRADE SHALL BE INSPECTED AT THE TIME OF CONSTRUCTION TO DETERMINE SUBGRADE PREPARATION REQUIREMENTS.

TYPICAL PERMANENT ACCESS ROAD DETAIL 2

NOT TO SCALE



NOTES:

1. BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR TREE PROTECTION FENCE, ONLY.
2. BOUNDARIES OF RETENTION AREA WILL BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHALL BE STAKED AND FLAGGED PRIOR TO INSTALLING TREE PROTECTION FENCE.
4. AVOID DAMAGES TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. TREE PROTECTION SIGNS ARE REQUIRED.
6. TREE PROTECTION FENCE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

PLASTIC MESH TREE PROTECTION FENCE 3

NOT TO SCALE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS | Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

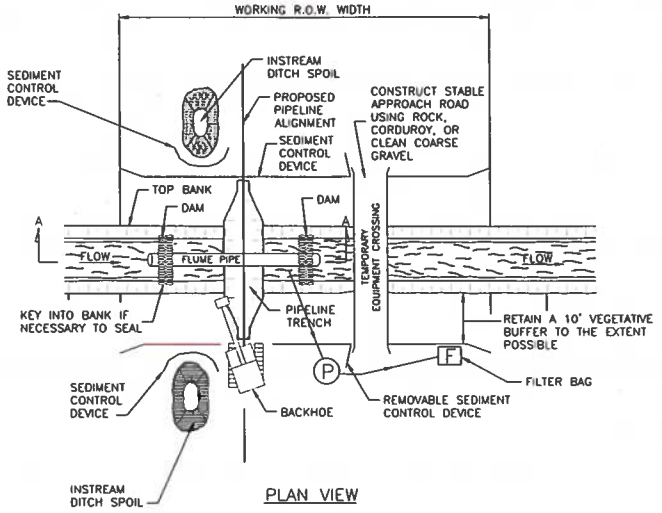
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-05

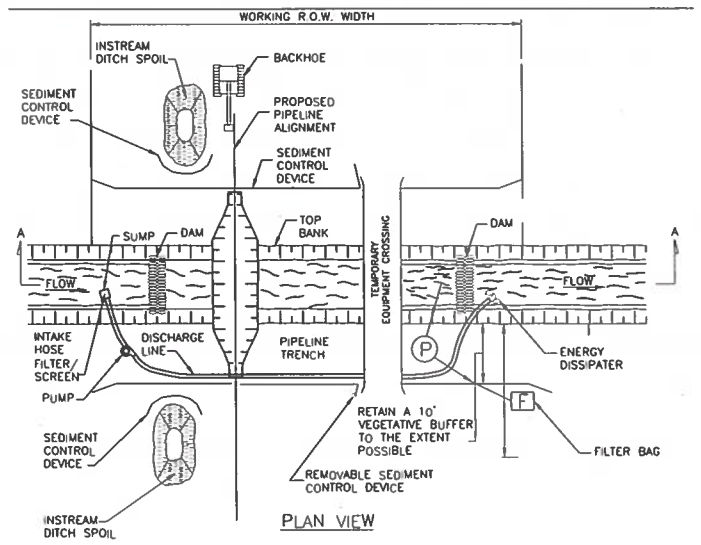


NOTES:
1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.

CONSTRUCTION PROCEDURES:

1. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURE; NEEDED TO PROTECT WATER QUALITY.
2. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE FLUME MUST BE ON-SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER WORK.
3. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SEDIMENT CONTROL DEVICE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE.
4. INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO SILT LADEN WATER ENTERS STREAM.
   a. NO SILT LADEN WATERS SHALL BE DISCHARGED DIRECTLY INTO THE STREAM.
   b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
   c. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A GEOTEXTILE FILTER BAG.
   d. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE CONSTRUCTION WORK AREA EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
   e. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
5. PIPE SHALL BE READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
6. ENSURE THAT THE DAMS AND VEHICLE CROSSINGS ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION.
7. FLUMES SHOULD BE SET WITH 10 PERCENT OF THEIR DIAMETER BELOW STREAMBED LEVELS WHERE SOIL CONDITIONS PERMIT (OTHERWISE INSTALLED AT STREAM GRADE AND SLOPE.)
8. FLUME PIPES WILL BE PROPERLY ALIGNED TO PREVENT BANK EROSION AND STREAMBED SCOUR.
9. PLACE IMPERVIOUS DAMS AT EACH END OF THE FLUME, UPSTREAM FIRST, THEN DOWN STREAM. ACCEPTABLE ALTERNATIVE INCLUDES INFLATABLE PLASTIC DAMS OR SAND BAGS. DURING INSTALLATION, INSTALL AN IMPERVIOUS MEMBRANE, IF NECESSARY, TO LIMIT LEAKAGE. DAMS MAY NEED KEYING INTO THE BANK AND STREAMBED. EXCAVATE TRENCH THROUGH PLUGS AND UNDER FLUME FROM BOTH SIDES. WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
   a. LOWER-IN PIPE BY PASSING UNDER FLUME AND BACKFILL IMMEDIATELY WITH SPOIL MATERIAL.
   b. IF THE SPOIL MATERIAL IS NOT SUITABLE, USE IMPORTED CLEAN GRANULAR MATERIAL.
10. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL SHALL BE CONTAINED TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
11. FLUMES SHOULD BE REMOVED AS SOON AS POSSIBLE, WHEN NO LONGER REQUIRED FOR PIPE LAYING OR FOR ROAD ACCESS, IN THE FOLLOWING MANNER:
   a. REMOVE THE VEHICLE CROSSING RAMP. BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE FLOW CONDITIONS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP,ETC.) TO MAXIMUM EXTENT POSSIBLE BEFORE REMOVING THE DAMS.
   b. REMOVE DOWNSTREAM DAM.
   c. REMOVE UPSTREAM DAM.
   d. REMOVE FLUME.
   e. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.
12. RESTORE THE STREAMBED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, STABLE ANGLE OF REPOSE, AS APPROVED BY THE ENVIRONMENTAL INSPECTOR.
   a. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED.
   b. MAINTAIN SEDIMENT CONTROL DEVICES ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.

FLUME CROSSING DETAIL (1)
NOT TO SCALE

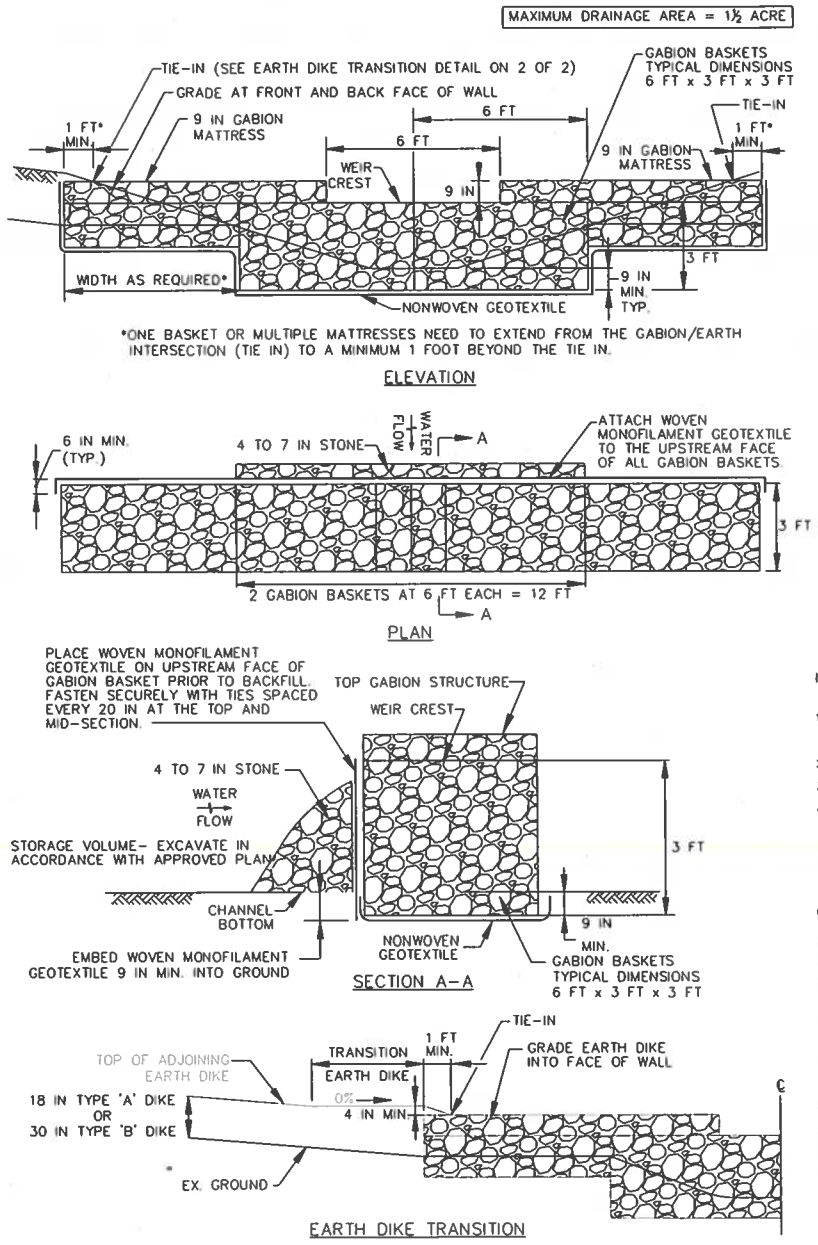


NOTES:
1. PIPELINE PLACEMENT WITHIN RIGHT-OF-WAY CONCEPTUAL ONLY.

CONSTRUCTION PROCEDURES:

1. IF THERE IS ANY FLOW IN THE WATERCOURSE, INSTALL PUMPS TO MAINTAIN STREAMFLOW AROUND THE BLOCK OFF SECTIONS OF CHANNEL. A SECOND STANDBY PUMP OF EQUAL CAPACITY IS TO BE READILY AVAILABLE AT ALL TIMES. PUMP INTAKES WILL BE SCREENED TO MINIMIZE FISH ENTRAINMENT. AN ENERGY DISSIPATER IS TO BE BUILT TO ACCEPT PUMP DISCHARGE WITHOUT STREAMBED OR STREAMBANK EROSION. IF THE CROSSING IS PROLONGED BEYOND ONE DAY THE OPERATION NEEDS TO BE MONITORED OVERNIGHT.
2. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS IF POSSIBLE.
3. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURE NEEDED TO PROTECT WATER QUALITY. INSTALL PRE-WORK SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE PLAN OR IN ACCORDANCE WITH THE ECS. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE DAMS AND TO PUMP WATER MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER CONSTRUCTION. PIPE SHOULD BE READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
4. INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED AND ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO SILT LADEN WATER ENTERS STREAM.
   a. NO SILT LADEN WATERS SHALL BE DISCHARGED DIRECTLY INTO THE STREAM.
   b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
   c. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A GEOTEXTILE FILTER BAG.
   d. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
   e. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
5. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 10 FT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SEDIMENT CONTROL DEVICE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE.
6. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT OR SEDIMENT CONTROL DEVICE WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
7. CHEMICALS, FUELS, LUBRICATING OILS, SHALL NOT BE STORED AND EQUIPMENT REFILLED WITHIN 100 FT. OF THE WATERBODY. PUMPS ARE TO BE REFUELED AS PER THE SPCC PLANS.
8. STAGING AREAS ARE TO BE LOCATED AT LEAST 10 FT. FROM THE WATERS EDGE (WHERE TOPOGRAPHIC CONDITIONS PERMIT) AND SHALL BE THE MINIMUM SIZE NEEDED.
9. DAMS ARE TO BE MADE OF INFLATABLE PLASTIC DAM OR SAND BAGS. DAMS MAY NEED KEYING INTO THE BANKS AND STREAMBED. ENSURE THAT THE DAM AND VEHICLE CROSSINGS ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION.
10. EXCAVATE TRENCH THROUGH PLUGS AND STREAMBED FROM BOTH SIDES, RE-POSITIONING DISCHARGE HOSE AS NECESSARY. LOWER THE PIPE IN THE TRENCH AND BACKFILL IMMEDIATELY. DURING THIS OPERATION WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
11. RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PE-CONSTRUCTION CONTOURS OR A STABLE ANGLE OF REPOSE, AS APPROVED BY THE ENVIRONMENTAL INSPECTOR.
   a. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED.
   b. MAINTAIN SEDIMENT CONTROL DEVICE ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
15. DAMS ARE TO BE REMOVED DOWNSTREAM FIRST. KEEP PUMP RUNNING UNTIL NORMAL FLOW IS RESUMED. SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.

DAM AND BYPASS DETAIL (2)
NOT TO SCALE



PLANS APPROVED BY: _____
DATE: _____
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

NOTES:
1. PROVIDE TRANSITION LENGTH AND HEIGHT AS SPECIFIED ON PLAN. HEIGHT OF TRANSITION EARTH DIKE MUST EXCEED 4 INCH MINIMUM FREEBOARD ABOVE TOP OF GABION AND EXTEND AT THIS ELEVATION UNTIL IT INTERCEPTS THE TOP OF ADJOINING EARTH DIKE.
2. PROVIDE POSITIVE DRAINAGE ALONG EARTH DIKE TO GABION OUTLET STRUCTURE.
3. COMPACT FILL.
4. SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED ON PLAN. BANK PROJECTIONS OR IRREGULARITIES ARE NOT ALLOWED.

CONSTRUCTION SPECIFICATIONS

1. PROVIDE STORAGE VOLUME AS SPECIFIED ON APPROVED PLANS.
2. USE BASKETS MADE OF 11 GAUGE WIRE OR HEAVIER.
3. USE NONWOVEN AND WOVEN MONOFILAMENT GEOTEXTILES AS SPECIFIED IN SECTION H-1 MATERIALS.
4. INSTALL GABIONS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.
5. EMBED THE GABION OUTLET STRUCTURE INTO THE SOIL A MINIMUM OF 9 INCHES. PROVIDE NONWOVEN GEOTEXTILE UNDER ALL GABIONS.
6. FILL GABION BASKETS WITH CLEAN 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE WITHOUT REBAR OR WIRE MESH.
7. MAKE THE WEIR CREST OF THE GABION OUTLET STRUCTURE 9 INCHES LOWER THAN THE TOP OF THE ADJACENT GABIONS.
8. PROVIDE A MINIMUM WEIR CREST OF 6 FEET.
9. ATTACH WOVEN MONOFILAMENT GEOTEXTILE TO THE UPSTREAM FACE OF GABION BASKETS AND COVER WITH 4 TO 7 INCH STONE.
10. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO WITHIN 12 INCHES OF THE WEIR CREST. REPLACE GEOTEXTILE AND STONE FACING WHEN STRUCTURE CEASES TO FUNCTION. MAINTAIN LINE, GRADE, AND CROSS SECTION.
11. UPON REMOVAL OF GABION OUTLET STRUCTURE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

TEMPORARY GABION OUTLET STRUCTURE (3)
NOT TO SCALE

XREFS: CGTL8000-TB-34x22
IMAGES:

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING. USE TO VERIFY FIGURE REPRODUCTION SCALE

No	Date	Revisions	By	Ckd

THIS DRAWING IS THE PROPERTY OF THE ARCADIS ENTITY IDENTIFIED IN THE TITLE BLOCK AND MAY NOT BE REUSED OR ALTERED IN WHOLE OR IN PART WITHOUT THE EXPRESS WRITTEN PERMISSION OF SAME

Professional Engineer's Name: MICHAEL B. HIGGINS
Professional Engineer's No.: MD 52652
State: MD | Date Signed: 11/28/2018 | Project Mgr.: JD
Designed by: SES | Drawn by: BJJ | Checked by: MBH

ARCADIS Design & Consultancy for natural and built assets
ARCADIS U.S., INC.

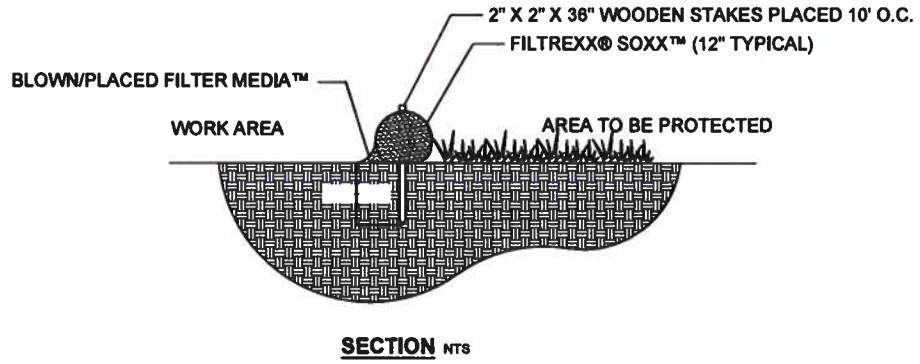
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

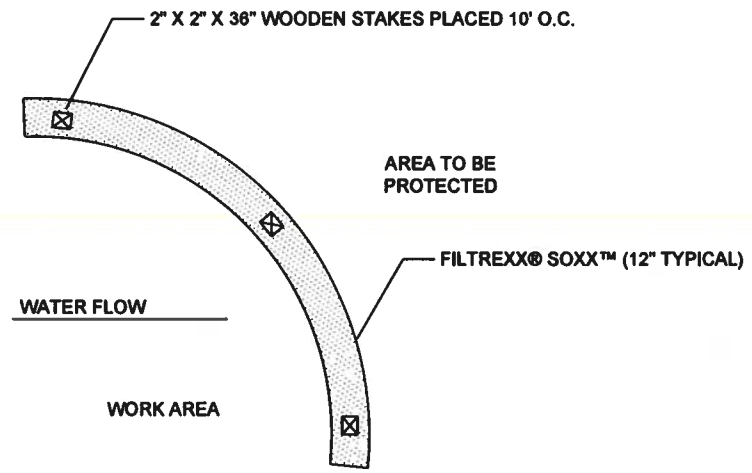
ARCADIS Project No.: CGTL8000.0001
Date: NOVEMBER 2018
ARCADIS U.S., INC. 50 FOUNTAIN PLAZA SUITE 600 BUFFALO, NY 14202 Tel. 315.671 9545

D-06

93 OF 94



SECTION NTS



PLAN

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

MAXIMUM PERMISSIBLE SLOPE LENGTH FOR FILTREXX SEDIMENT CONTROL BASED ON A 2IN (50MM)/24 HR RAINFALL EVENT

SLOPE PERCENT	MAXIMUM SLOPE LENDTH ABOVE SEDIMENT CONTROL IN FEET (METERS)*				
	8IN (200 MM) SEDIMENT CONTROL	12IN (300 MM) SEDIMENT CONTROL	18IN (450 MM) SEDIMENT CONTROL	24IN (600 MM) SEDIMENT CONTROL	32IN (800 MM) SEDIMENT CONTROL
	6.5IN (160 MM) **	9.5IN (240MM) **	14.5 IN (360 MM) **	19IN (480 MM) **	26IN (650 MM) **
2 (OR LESS)	600 (180)	750 (225)	1000 (300)	1300 (400)	1650 (500)
5	400 (120)	500 (150)	550 (165)	650 (200)	750 (225)
10	200 (60)	250 (75)	300 (90)	400 (120)	500 (150)
15	140 (40)	170 (50)	200 (60)	325 (100)	450 (140)
20	100 (30)	125 (38)	140 (42)	260 (80)	400 (120)
25	80 (24)	100 (30)	110 (33)	200 (60)	275 (85)
30	60 (18)	75 (23)	90 (27)	130 (40)	200 (60)
35	60 (18)	75 (23)	80 (24)	115 (35)	150 (45)
40	60 (18)	75 (23)	80 (24)	100 (30)	125 (38)
45	40 (12)	50 (15)	60 (18)	80 (24)	100 (30)
50	40 (12)	50 (15)	55 (17)	65 (20)	75 (23)

* BASED ON A FAILURE POINT OF 36 IN (.9M) SUPER SILT DENCE (WIRE REINFORCED) AT 1000 FT 9303M) OF SLOPE, WATERSHED WIDTH EQUIVALENT TO RECEIVING LENGTH OF SEDIMENT CONTROL DEVICE, 1IN/24 HR (25 MM/24 HR) RAIN EVENT
** EFFECTIVE HEIGHT OF SEDIMENT CONTROL AFTER INSTALLATION AND WITH CONSTANT HEAD FROM RUNOFF AS DETERMINED BY OHIO STATE UNIVERSITY

NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.
4. COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST 8 FEET UP SLOPE AT 45 DEGREES TO THE MAIN SOCK ALIGNMENT.
5. TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVEGROUND HEIGHT OF THE SOCK AND DISPOSED AS IDENTIFIED IN THE ESCP.
7. SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
8. UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED, OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.
9. CONTRACTOR SHALL ENSURE THAT ACTUAL COMPOST FILTER SOCK DIMENSIONS MEET SPECIFIED DESIGN DIMENSIONS.
10. COMPOST FILTER SOCKS SHALL BE SIZED IN ACCORDANCE WITH FILTREXX DESIGN MANUAL SPECIFICATIONS (REPLICATED ABOVE).

FILTREXX® COMPOST FILTER SOCK CONTROL (1)

NOT TO SCALE

NOT TO SCALE

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd

Professional Engineer's Name		
MICHAEL B. HIGGINS		
Professional Engineer's No.		
MD 52652		
State	Date Signed	Project Mgr.
MD	11/28/2018	JD
Designed by	Drawn by	Checked by
SES	BJJ	MBH

ARCADIS Design & Consultancy for natural and built assets

ARCADIS U.S., INC.

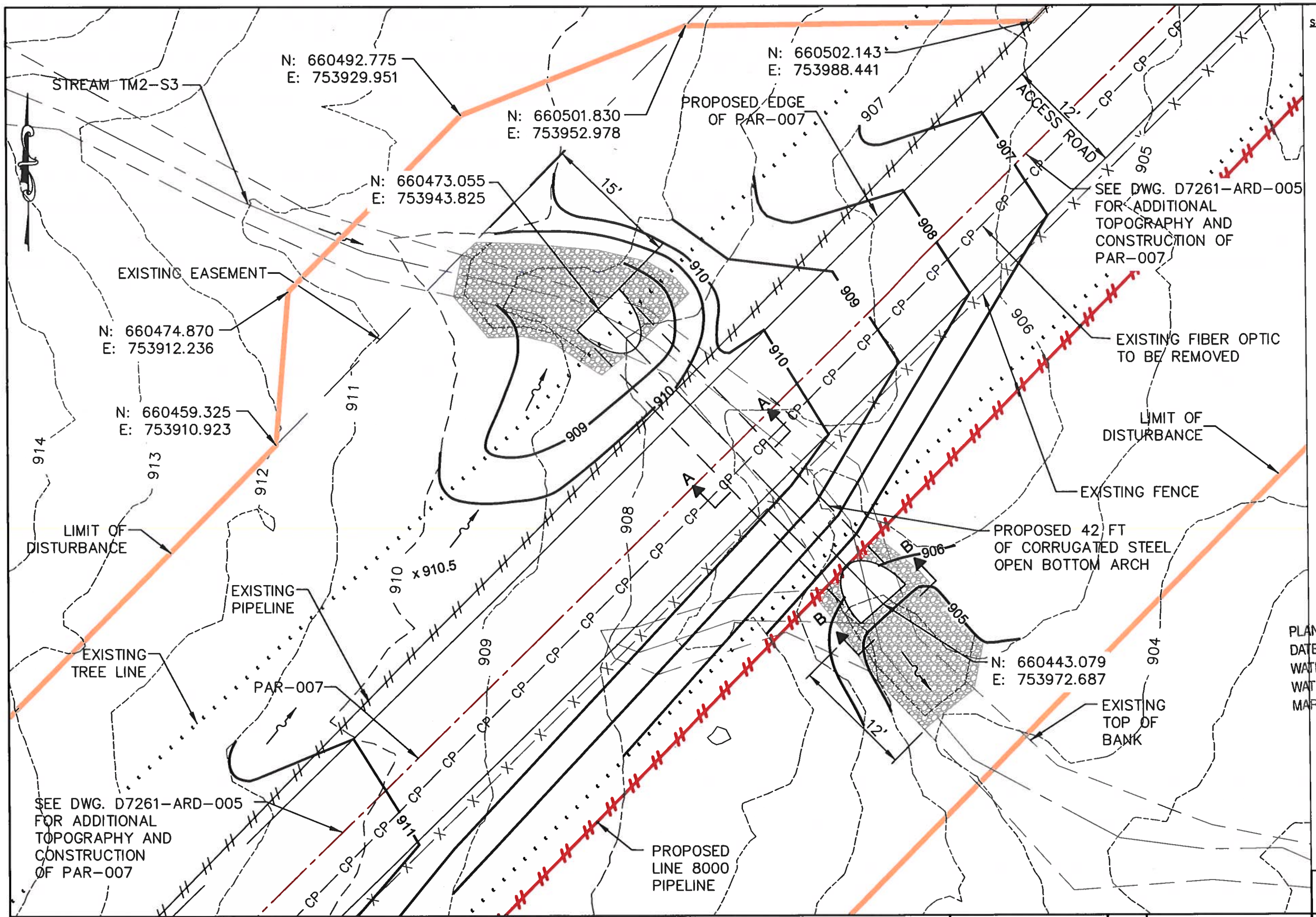
COLUMBIA GAS TRANSMISSION, LLC., A TRANSCANADA COMPANY • ALLEGANY COUNTY, MARYLAND
LINE 8000 - AQUATIC RESOURCE CROSSINGS

DETAILS

ARCADIS Project No. CGTL8000.0001
Date NOVEMBER 2018

ARCADIS U.S., INC.
50 FOUNTAIN PLAZA
SUITE 600
BUFFALO, NY 14202
Tel. 315.671.9545

D-07



S-3 CULVERT NOTES:

1) CONSTRUCTION AND BACKFILL OF THE PROPOSED CULVERT SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS. BACKFILL MUST BE PLACED SYMMETRICALLY ON EACH SIDE OF THE STRUCTURE IN 8-INCH LIFTS. EACH LIFT IS TO BE COMPACTED TO A MINIMUM OF 90 PERCENT DENSITY PER AASHTO T180.
2) EROSION CONTROL IS PROVIDED ON THE E&S PLANS PREPARED BY OTHERS.
3) CLEARING, GRUBBING AND AND OTHER ENVIRONMENTAL IMPACTS REQUIRING PERMITS ARE PROVIDED ON THE E&S PLANS.
4) THE INTENT OF THE PLAN IS FOR THE S-3 CULVERT SIZING AND SURROUNDING GRADING THE ROADWAY, UTILITY AND OTHER WORK IS PROVIDED ON OTHER DRAWINGS.
5) A SITE SPECIFIC GEOTECHNICAL REPORT IS REQUIRED TO SIZE THE CONTECH ARCH FOOTER, THE STEEL GAGE AND THE LIMITS OF THE STRUCTURAL BACKFILL. THE CONTRACTOR SHALL PRODUCE THE REPORT AND COMPLETE THE DESIGN PER THE MANUFACTURERS SPECIFICATIONS.
6) THE PROPOSED CORRUGATED METAL OPEN BOTTOM ARCH IS A CONTECH MULTI PLATE SINGLE RADIUS ARCH WITH A 6'-0" SPAN AND A 1'-10" RISE. SPECIFICATIONS ARE PROVIDED IN CONTECH'S STRUCTURAL PLATE DESIGN GUIDE 6TH EDITION.
7) EXISTING GRADES DEPICTED ON THIS PLAN AND PROFILE ARE BASED ON TOPOGRAPHIC CONTOURS GENERATED FROM MD iMAP LIDAR DEM – MARYLAND MAPPING & GIS DATA PORTAL AND DEM WEST VIRGINIA GIS TECHNICAL CENTER DATED 07/03/2018.
8) HORIZONTAL CONTROL IS NAD 83 MARYLAND STATE PLANE PROVIDED BY ARCADIS ON 07/2017

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

811 Know what's below. Call before you dig.
CALL: 1-800-257-7777

LEGEND
- PROPOSED EDGE OF ACCESS ROAD
- EXISTING PIPELINE (ABANDONED IN PLACE)
- LIMITS OF DISTURBANCE
- EXISTING TREELINE
- EXISTING FENCE
- EXISTING EASEMENT
- ACCESS ROAD
- ADDITIONAL WORK SPACE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED PIPELINE
- PROPOSED ACCESS ROAD
- INLET/OUTLET RIP RAP

SCALE: 1" = 10'
5 2.5 0 5 10

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

DWG. NO. REFERENCE

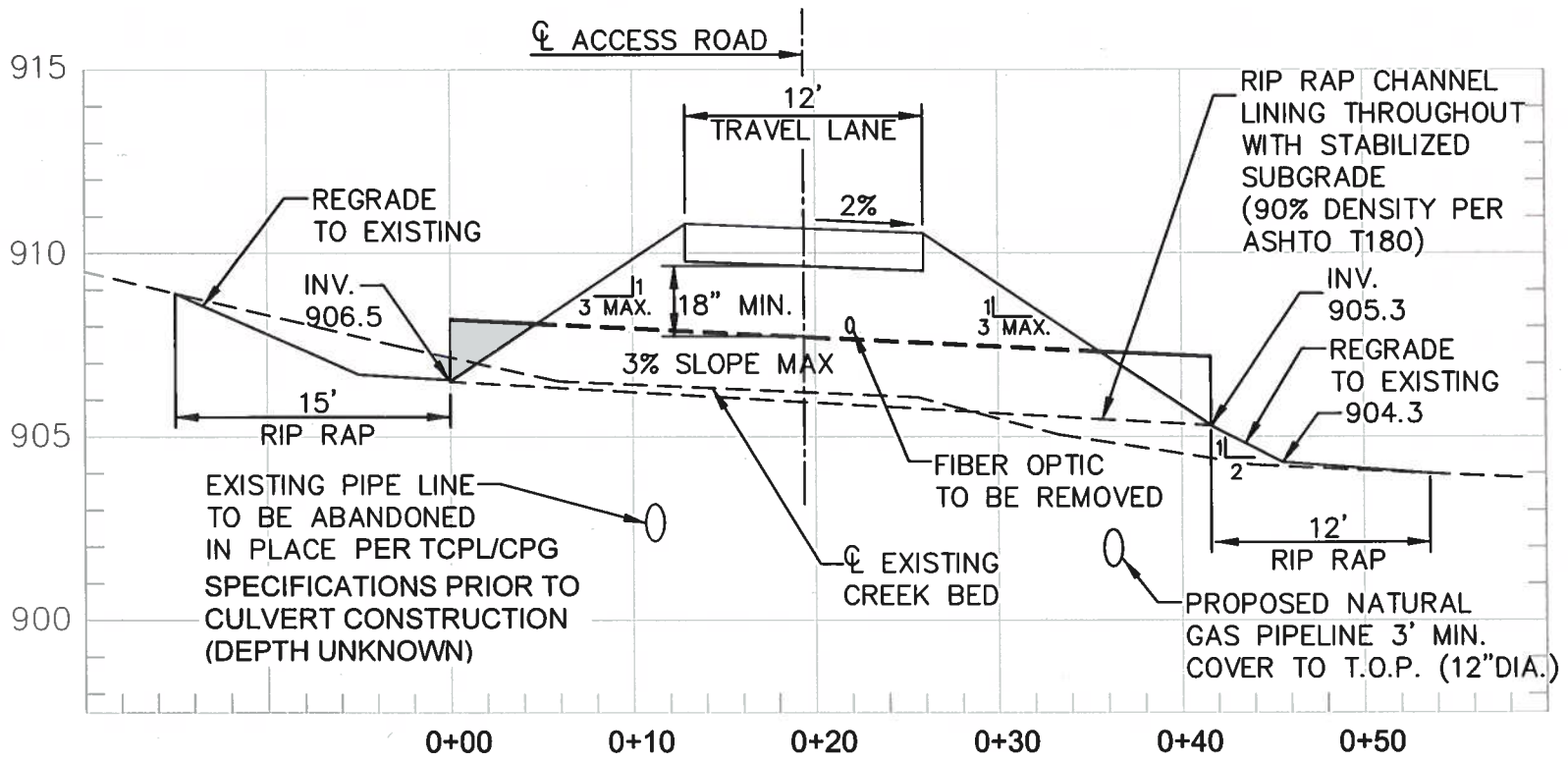
M M MOTT MACDONALD

Columbia Gas Transmission
COLUMBIA GAS TRANSMISSION, LLC
1700 MACCORKLE AVE., SE, PO BOX 1273
CHARLESTON, WV 25314

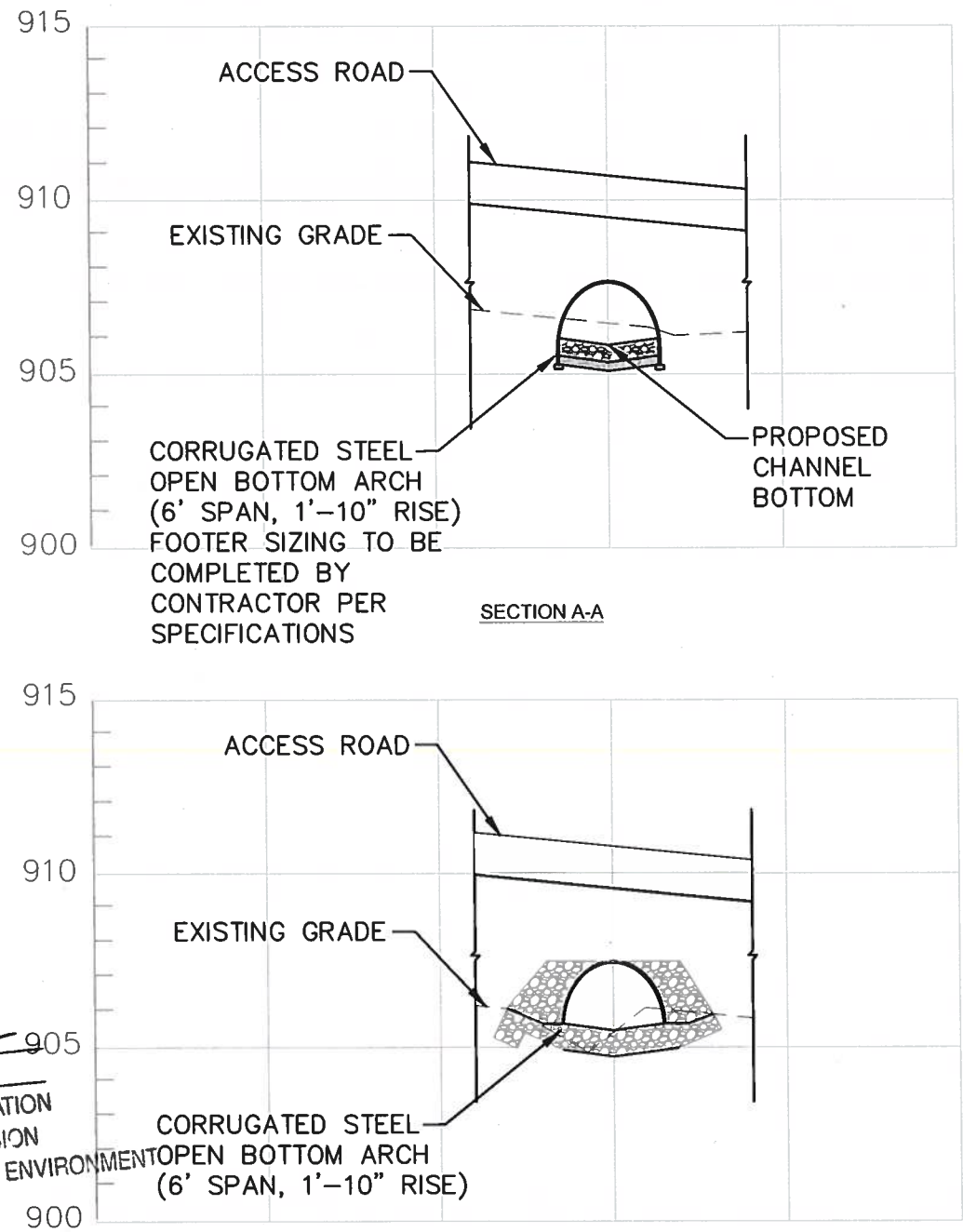
PROJECT: LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
WEST VIRGINIA & MARYLAND

TITLE: S-3 CULVERT CROSSING PLAN
CROSSING OF STREAM TM2-S3
ALLEGHENY COUNTY, MD

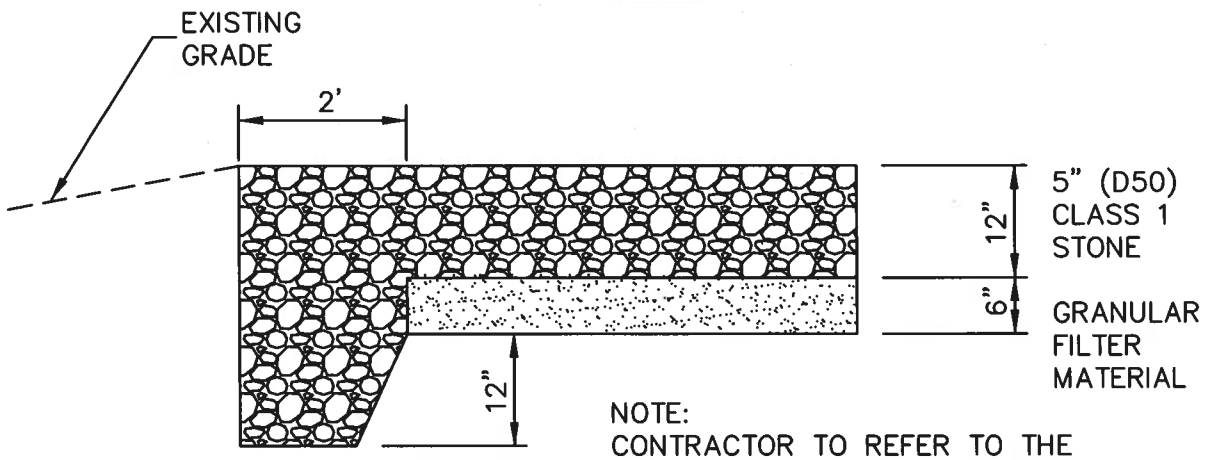
DRAWN BY	DATE	DRAWING NUMBER	SHEET	ISSUE
PROJECT NUMBER 386318	July 3, 2018	B7261-ENV-001A		
WORK ORDER NUMBER				



PROFILE



SECTION A-A



NOTE:
CONTRACTOR TO REFER TO THE MARYLAND DEPARTMENT OF ENVIRONMENT CONSTRUCTION GUIDELINES TABLE 3.1 a & b FOR PRODUCT AND INSTALLATION REQUIREMENTS

CULVERT INLET / OUTLET RIP RAP DETAIL

PLANS APPROVED BY:
DATE:
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

SECTION B-B

SCALE: 1" = 10' HORIZONTAL
1" = 5' VERTICAL
5 2.5 0 5 10

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

No.	REVISIONS	APPROVED BY	DATE

MOTT MACDONALD

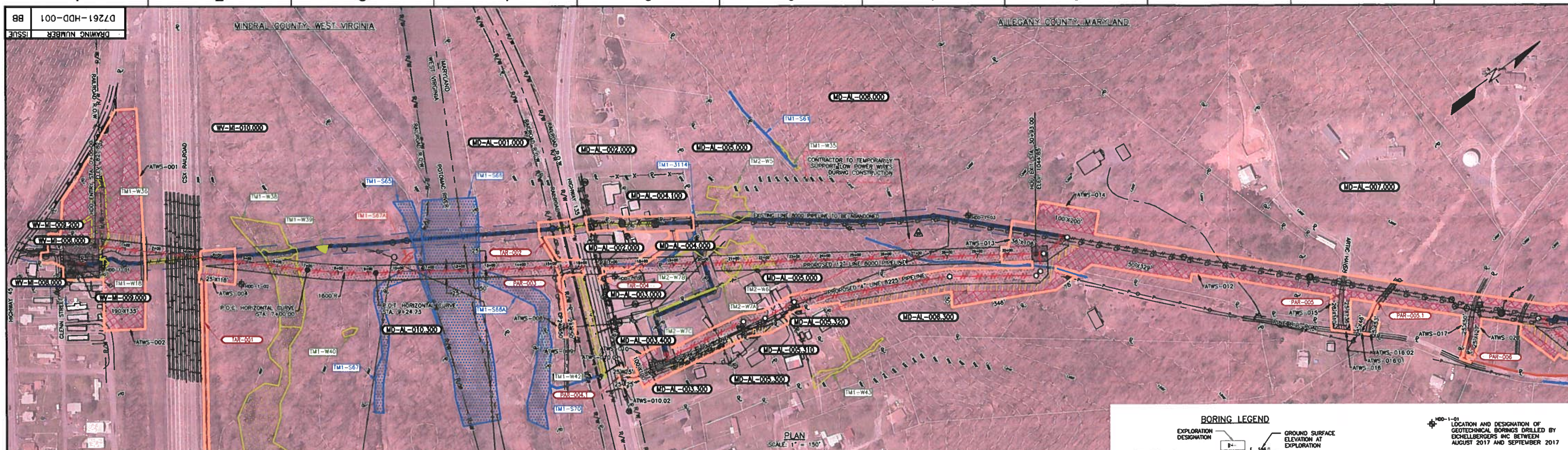
Columbia Gas Transmission
COLUMBIA GAS TRANSMISSION, LLC
1700 MACCORKLE AVE., SE PO BOX 1273
CHARLESTON, WV 25314

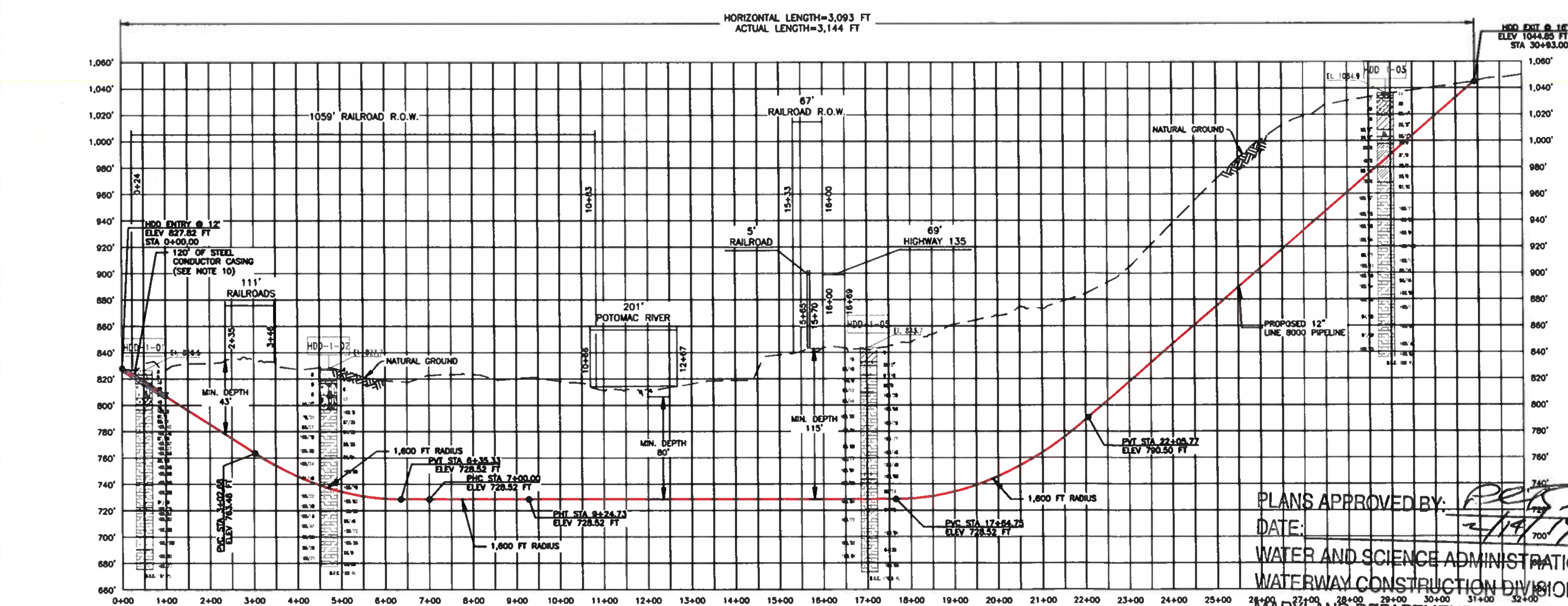
PROJECT: PIPELINE REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
WEST VIRGINIA & MARYLAND

TITLE: S-3 CULVERT CROSSING PROFILE AND SECTIONS
CROSSING OF STREAM TM2-S3
ALLEGHENY COUNTY, MD

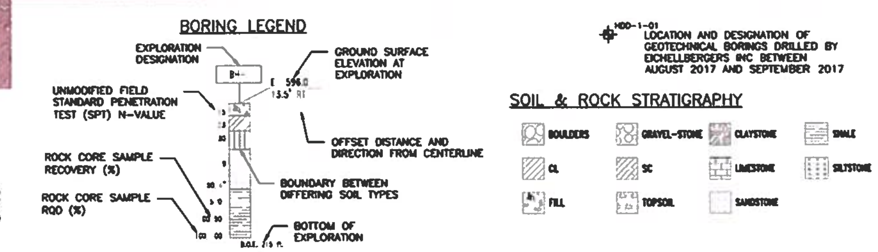
DWG. NO.	REFERENCE	DRAWN BY	DATE	DRAWING NUMBER	SHEET	ISSUE
		PROJECT NUMBER	July 3, 2018	B7261-ENV-0018		
		CGC DWG NUMBER				

G:\Columbia\386318_Line_8000\Pipeline\Drafting\HDDs\D7261-HDD-001_Potomac River HDD.dwg
9/28/2018 3:09 PM Pangburn, Richard





PLANS APPROVED BY:
DATE:
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT



GENERAL NOTES:

1. THE OPERATIONAL ROW BETWEEN THE HDD ENTRY/EXIT LOCATIONS WILL BE CLEARED IN UPLAND AREAS TO A WIDTH OF 10 FEET WITHIN THE PROPOSED PROJECT CONSTRUCTION LIMITS. NOTE THAT CLEARING WILL NOT BE ALLOWED IN RESOURCE AREAS.
2. CONTRACTOR SHALL SUBMIT A DETAILED PLAN OF WORK FOR ALL DRILLING OPERATIONS INCLUDING PILOT BORE, REAMING, AND PULLBACK OPERATIONS FOR APPROVAL BEFORE HDD OPERATIONS ARE COMMENCED.
3. PILOT BORE WILL BE TRACKED CONSTANTLY WITH LOCATION AND DEPTH MARKED EVERY 10 FEET. NO BLIND SECTION SHALL BE PERMITTED.
4. THROUGHOUT PILOT BORE DRILLING THE DRILLING FLUID PRESSURE SHALL BE MEASURED AT ALL TIMES AND AT A POINT AS CLOSE AS POSSIBLE BEHIND THE DRILL BIT. AT NO TIME WILL THE DRILLING FLUID PRESSURE BE PERMITTED TO EXCEED ONE-HALF OF THE CALCULATED MAXIMUM ALLOWABLE PRESSURE OF THE FORMATION.
5. CONTRACTOR SHALL ADHERE TO TCPL SPECIFICATIONS FOR HDD INSTALLATION.

HDD CONSTRUCTION:

1. CONTRACTOR SHALL DRILL THIS INSTALLATION FROM THE LOWER ELEVATION TOWARDS THE HIGHER ELEVATION (SOUTH TO NORTH).
2. CONTRACTOR SHALL USE A GYROSCOPIC GUIDANCE SYSTEM TO COMPLETE THE PILOT BORE STAGE OF THE INSTALLATION PROCESS.
3. PRODUCT PIPE SHALL BE STAGED ON THE NORTH SIDE OF THE CROSSING.
4. COMPOSITION OF THE DRILLING FLUID USED SHALL BE APPROVED BY CPG'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF THE DRILLING OPERATION. DURING DRILLING OR PIPE PULL OPERATIONS, NO SUBSTANCE SHALL BE ADDED TO THE DRILLING FLUID WITHOUT CPG'S WRITTEN AUTHORIZATION.
5. CONTRACTOR SHALL SUBMIT AND DEVELOP A SPILL RESPONSE PROGRAM FOR CPG'S REVIEW IN ACCORDANCE WITH THE HDD CONTINGENCY PLAN.
6. IF A SUMP PIT IS USED, THE CONTRACTOR SHALL ENSURE DRILLING FLUID IS CONTAINED WITHIN A LINED OR IMPERMEABLE SUMP PIT.
7. A SLURRY PIT LOCATION MAY BE IDENTIFIED WITHIN THE WORK AREA FOR DRILLING FLUID DISPOSAL. IF AN APPROVED LOCATION IS IDENTIFIED, THE CONTRACTOR SHALL ENSURE PROPER MAINTENANCE, STORAGE AND TRUCKING OF ALL DRILLING FLUIDS TO THE SLURRY PIT. IF NOT IDENTIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER STORAGE, TRUCKING AND DISPOSAL OF ALL DRILLING FLUIDS. ALL ACTIVITIES RELATING TO DRILLING FLUIDS SHALL CONFORM TO APPLICABLE REGULATIONS.
8. IF CONTRACTOR ENCOUNTERS AN OBSTRUCTION WHICH PREVENTS THE INSTALLATION ACCORDING TO THE SPECIFICATIONS, THE BORE SHALL BE ABANDONED IN PLACE AN IMMEDIATELY FILLED WITH GROUT. WORK SHALL NOT RESUME UNTIL REVISED PLANS HAVE BEEN SUBMITTED TO AND APPROVED BY CPG.
9. UPON COMPLETION, CONTRACTOR SHALL PLACE A UNIFORM CEMENTITIOUS GROUT UNDER PRESSURE TO FILL ANY VOIDS BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH FOR THE ENTIRE LENGTH OF THE COMPLETED INSTALLATION. GROUT SHOULD BE INSTALLED FROM BOTH THE ENTRY AND EXIT LOCATIONS OF THE HDD INSTALLATION.
10. CONTRACTOR SHALL DETERMINE DIAMETER, GRADE, WALL THICKNESS AND ADDITIONAL LENGTH OF TEMPORARY CONDUCTOR CASINGS THAN THOSE SHOWN ON DRAWING. ANY INSTALLED CONDUCTOR CASING SHALL BE FULLY REMOVED UPON COMPLETION OF PULLBACK OPERATIONS.
11. CONTRACTOR SHALL DETERMINE IF THE USE OF TEMPORARY CONDUCTOR CASING ALONG THE HDD EXIT TANGENT IS REQUIRED TO COMPLETE THE HDD INSTALLATION.
12. CONTRACTOR SHALL COORDINATE WITH TCPL AND ITS LAND/ROW GROUP REGARDING THE CLOSURE OF ARCTIC HAVEN AND PRIVATE DRIVE FOR PIPE FABRICATION, TESTING, AND PULLBACK OPERATIONS.

SURVEY AND PIPE ALIGNMENT:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN FEET, UNLESS OTHERWISE SPECIFIED.
2. ALL STATIONING VALUES ARE BASED ON A HORIZONTAL DATUM.
3. MINIMUM ALLOWABLE PIPE BEND RADIUS IS 800 FT BASED ON A 3-JOINT AVERAGE.
4. INSTALL PIPELINE AS CLOSE AS PRACTICAL TO THE PROPOSED PIPELINE CENTERLINE, AS SHOWN ON THE DRAWING. DEVIATIONS SHALL FOLLOW THE BELOW REQUIREMENTS:
   - PILOT ENTRY ANGLE: INCREASE ANGLE UP TO 1 DEGREE (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
   - PILOT ENTRY LOCATION: AS STAKED BY OWNER. NO CHANGES WITHOUT CPG APPROVAL.
   - PILOT EXIT ANGLE: DECREASE ANGLE UP TO 2 DEGREES (FLATTER), BUT NO INCREASES IN EXIT ANGLE ALLOWED.
   - PILOT EXIT LOCATION: UP TO SIXTEEN (16) FEET LONGER OR TEN (10) FEET SHORTER.
   - PILOT DEPTH: UP TO 6.6 FEET SHALLOWER IN DEPTH ALLOWED. UP TO 6.6 FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
   - PILOT ALIGNMENT: BETWEEN 6.5 FEET LEFT AND 6.5 FEET RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN THREE (3) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY.
5. CONTRACTOR SHALL PROVIDE A FINAL AS-BUILT PIPELINE PLAN AND PROFILE TO CPG WITHIN 15 DAYS OF COMPLETION.
6. CONTRACTOR IS REQUIRED TO PULL AN ADDITIONAL AMOUNT OF PIPELINE, AMOUNT TO BE REQUESTED BY CPG'S REPRESENTATIVE (MINIMUM 15 FEET), COMPLETELY THROUGH THE BOREHOLE TO ALLOW FOR VISUAL INSPECTION OF POTENTIAL PIPELINE OR COATING DAMAGE.

ENVIRONMENTAL:

1. REFER TO ENVIRONMENTAL PROTECTION PLAN ALIGNMENT SHEETS FOR ENVIRONMENTAL FEATURES.
2. CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS AS SET OUT IN THE PROJECT'S ENVIRONMENTAL PROTECTION PLAN.
3. DURING CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES SUCH AS SILT FENCES OR BERMS SHALL BE INSTALLED TO PREVENT SEDIMENT RUNOFF.

LEGEND: PROPOSED PIPELINE; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; LIMIT OF DISTURBANCE; 10' CONTOURS; ℄ OF RAILROAD; EXISTING PERMANENT EASEMENT; PROPOSED PERMANENT EASEMENT; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; ACCESS ROAD NUMBER; PROPERTY TRACT NUMBER; WETLAND ID; EPHEMERAL STREAM ID; INTERMITTENT/PERENNIAL STREAM ID; WETLAND; EPHEMERAL STREAM; INTERMITTENT/PERENNIAL STREAM

811 Know what's below. Call before you dig.

ISSUED FOR BID ADDENDUM #4 10/02/18

SCALE: 1" = 150'-0"

NO.	REVISIONS	BY	DATE
A	ISSUED FOR BID - ADDENDUM #4	MM	09/2018

DWG. NO.	REFERENCE
D7261-ARD-003	ACCESS ROAD DETAIL
D7261-ARD-001	ACCESS ROAD DETAIL
D7261-ALG-030	PROPOSED 4" LINE 8225 ALIGNMENT SHEET
D7261-ALG-001	ALIGNMENT SHEET

CERTIFICATE: TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.

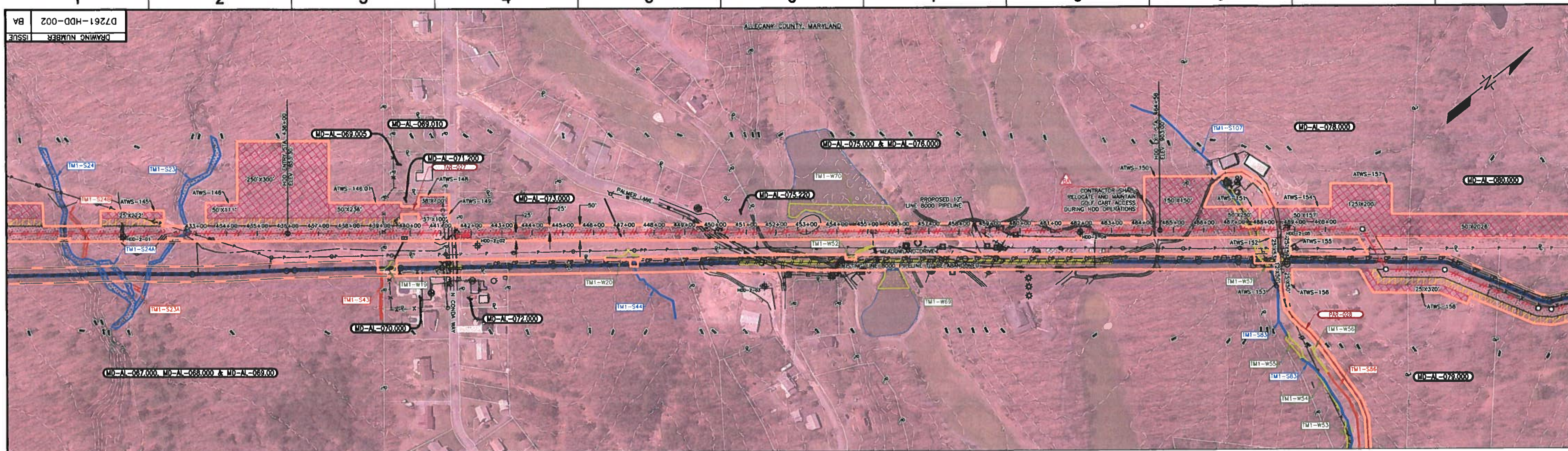
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

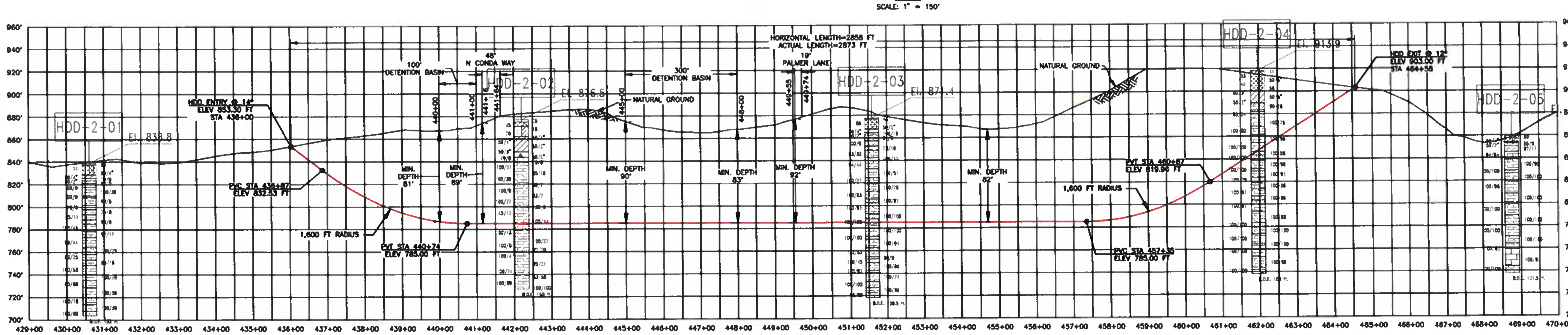
LINE 8000 REPLACEMENT PROJECT

TITLE: PROPOSED 12" HORIZONTAL DIRECTION DRILL
MINERAL COUNTY, WEST VIRGINIA & ALLEGANY COUNTY, MARYLAND

PROJECT NUMBER: M.000688.2
W.O. NUMBER: 5120949
DRAWING NUMBER: D7261-HDD-001
ISSUE: BB



PLAN
SCALE: 1" = 150'



PROFILE
HORIZ: 1" = 150'
VERT: 1" = 50'

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

GENERAL NOTES:

1. THE OPERATIONAL ROW BETWEEN THE HDD ENTRY/EXIT LOCATIONS WILL BE CLEARED IN UPLAND AREAS TO A WIDTH OF 10 FEET WITHIN THE PROPOSED PROJECT CONSTRUCTION LIMITS. NOTE THAT CLEARING WILL NOT BE ALLOWED IN RESOURCE AREAS.
2. CONTRACTOR SHALL SUBMIT A DETAILED PLAN OF WORK FOR ALL DRILLING OPERATIONS INCLUDING PILOT BORE, REAMING, AND PULLBACK OPERATIONS FOR APPROVAL BEFORE HDD OPERATIONS ARE COMMENCED.
3. PILOT BORE WILL BE TRACKED CONSTANTLY WITH LOCATION AND DEPTH MARKED EVERY 10 FEET. NO BLIND SECTION SHALL BE PERMITTED.
4. THROUGHOUT PILOT BORE DRILLING THE DRILLING FLUID PRESSURE SHALL BE MEASURED AT ALL TIMES AND AT A POINT AS CLOSE AS POSSIBLE BEHIND THE DRILL BIT. AT NO TIME WILL THE DRILLING FLUID PRESSURE BE PERMITTED TO EXCEED ONE-HALF OF THE CALCULATED MAXIMUM ALLOWABLE PRESSURE OF THE FORMATION
5. CONTRACTOR SHALL ADHERE TO TCPL SPECIFICATIONS FOR HDD INSTALLATION.

HDD CONSTRUCTION:

1. CONTRACTOR SHALL DRILL THIS INSTALLATION FROM THE LOWER ELEVATION TOWARDS THE HIGHER ELEVATION (SOUTH TO NORTH).
2. CONTRACTOR SHALL USE A GYROSCOPIC GUIDANCE SYSTEM TO COMPLETE THE PILOT BORE STAGE OF THE INSTALLATION PROCESS.
3. PRODUCT PIPE SHALL BE STAGED ON THE NORTH SIDE OF THE CROSSING.
4. COMPOSITION OF THE DRILLING FLUID USED SHALL BE APPROVED BY CPG'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF THE DRILLING OPERATION. DURING DRILLING OR PIPE PULL OPERATIONS, NO SUBSTANCE SHALL BE ADDED TO THE DRILLING FLUID WITHOUT CPG'S WRITTEN AUTHORIZATION.
5. CONTRACTOR SHALL SUBMIT AND DEVELOP A SPILL RESPONSE PROGRAM FOR CPG'S REVIEW.
6. IF A SUMP PIT IS USED, THE CONTRACTOR SHALL ENSURE DRILLING FLUID IS CONTAINED WITHIN A LINED OR IMPERMEABLE SUMP PIT.
7. A SLURRY PIT LOCATION MAY BE IDENTIFIED WITHIN THE WORK AREA FOR DRILLING FLUID DISPOSAL. IF AN APPROVED LOCATION IS IDENTIFIED, THE CONTRACTOR SHALL ENSURE PROPER MAINTENANCE, STORAGE AND TRUCKING OF ALL DRILLING FLUIDS TO THE SLURRY PIT. IF NOT IDENTIFIED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER STORAGE, TRUCKING AND DISPOSAL OF ALL DRILLING FLUIDS. ALL ACTIVITIES RELATING TO DRILLING FLUIDS SHALL CONFORM TO APPLICABLE REGULATIONS.
8. IF CONTRACTOR ENCOUNTERS AN OBSTRUCTION WHICH PREVENTS THE INSTALLATION ACCORDING TO THE SPECIFICATIONS, THE BORE SHALL BE ABANDONED IN PLACE AND IMMEDIATELY FILLED WITH GROUT. WORK SHALL NOT RESUME UNTIL REVISED PLANS HAVE BEEN SUBMITTED TO AND APPROVED BY CPG.
9. UPON COMPLETION, CONTRACTOR SHALL PLACE A UNIFORM CEMENTITIOUS GROUT UNDER PRESSURE TO FILL ANY VOIDS BETWEEN THE PRODUCT PIPE AND THE UNDISTURBED EARTH FOR THE ENTIRE LENGTH OF THE COMPLETED INSTALLATION.

SURVEY AND PIPE ALIGNMENT:

1. ALL DIMENSIONS AND ELEVATIONS ARE IN FEET, UNLESS OTHERWISE SPECIFIED.
2. ALL STATIONING VALUES ARE BASED ON A HORIZONTAL DATUM.
3. MINIMUM ALLOWABLE PIPE BEND RADIUS IS 800 FT BASED ON A 3-JOINT AVERAGE.
4. INSTALL PIPELINE AS CLOSE AS PRACTICAL TO THE PROPOSED PIPELINE CENTERLINE, AS SHOWN ON THE DRAWING. DEVIATIONS SHALL FOLLOW THE BELOW REQUIREMENTS:
   - PILOT ENTRY ANGLE: INCREASE ANGLE UP TO 1 DEGREE (STEEPER), BUT NO DECREASE IN ANGLE ALLOWED.
   - PILOT ENTRY LOCATION: AS STAKED BY OWNER. NO CHANGES WITHOUT CPG APPROVAL.
   - PILOT EXIT ANGLE: DECREASE ANGLE UP TO 2 DEGREES (FLATTER), BUT NO INCREASES IN EXIT ANGLE ALLOWED.
   - PILOT EXIT LOCATION: UP TO SIXTEEN (16) FEET LONGER OR TEN (10) FEET SHORTER.
   - PILOT DEPTH: UP TO 6.6 FEET SHALLOWER IN DEPTH ALLOWED. UP TO 6.6 FEET INCREASE IN PIPE DESIGN DEPTH (DEEPER) ALLOWED.
   - PILOT ALIGNMENT: BETWEEN 6.5 FEET LEFT AND 6.5 FEET RIGHT OF THE OWNER SURVEY CENTERLINE BUT NOT WITHIN THREE (3) FEET OF THE RIGHT-OF-WAY/EASEMENT BOUNDARY.
5. CONTRACTOR SHALL PROVIDE A FINAL AS-BUILT PIPELINE PLAN AND PROFILE TO CPG WITHIN 15 DAYS OF COMPLETION.
6. CONTRACTOR IS REQUIRED TO PULL AN ADDITIONAL AMOUNT OF PIPELINE, AMOUNT TO BE REQUESTED BY CPG'S REPRESENTATIVE (MINIMUM 15 FEET), COMPLETELY THROUGH THE BOREHOLE TO ALLOW FOR VISUAL INSPECTION OF POTENTIAL PIPELINE OR COATING DAMAGE.

ENVIRONMENTAL:

1. REFER TO ENVIRONMENTAL PROTECTION PLAN ALIGNMENT SHEETS FOR ENVIRONMENTAL FEATURES.
2. CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS AS SET OUT IN THE PROJECT'S ENVIRONMENTAL PROTECTION PLAN.
3. DURING CONSTRUCTION, TEMPORARY EROSION CONTROL MEASURES SUCH AS SILT FENCES OR BERMS SHALL BE INSTALLED TO PREVENT SEDIMENT RUNOFF.

BORING LEGEND

EXPLORATION DESIGNATION
GROUND SURFACE ELEVATION AT EXPLORATION
UNMODIFIED FIELD STANDARD PENETRATION TEST (SPT) N-VALUE
OFFSET DISTANCE AND DIRECTION FROM CENTERLINE
BOUNDARY BETWEEN DIFFERING SOIL TYPES
ROCK CORE SAMPLE RECOVERY (%)
ROCK CORE SAMPLE ROD (%)
BOTTOM OF EXPLORATION
HDD-2-01 LOCATION AND DESIGNATION OF GEOTECHNICAL BORINGS DRILLED BY ELCHELBERGERS INC BETWEEN AUGUST 2017 AND SEPTEMBER 2017

SOIL & ROCK STRATIGRAPHY

BOULDERS, GRAVEL-STONE, CLAYSTONE, SHALE, CL, SC, LIMESTONE, SILTSTONE, FILL, TOPSOIL, SANDSTONE

LEGEND:

PROPOSED PIPELINE; EXISTING COLUMBIA PIPELINE; FOREIGN PIPELINE; LIMIT OF DISTURBANCE; 10' CONTOURS; ℄ OF RAILROAD; EXISTING PERMANENT EASEMENT; PROPOSED PERMANENT EASEMENT; TEMPORARY WORKSPACE; ADDITIONAL TEMPORARY WORKSPACE; ACCESS ROAD; ACCESS ROAD NUMBER; PROPERTY TRACT NUMBER; WETLAND ID; EPHEMERAL STREAM ID; INTERMITTENT/PERENNIAL STREAM ID; WETLAND; EPHEMERAL STREAM; INTERMITTENT/PERENNIAL STREAM

811 Know what's below. Call before you dig.

ISSUED FOR BID ADDENDUM #2
DATE: 09/2018

MOTT MACDONALD
134 CAPITAL DRIVE SUITE D
WEST SPRINGFIELD MA 01089
UNITED STATES
413-436-0135
INFO@MOTTMAC.COM

SCALE: 1" = 150'-0"
150 0 75 150

DESIGN PRESSURE ___ PSIG AT ___ °F (___ DESIGN FACTOR). MAXIMUM HOOP STRESS LEVEL AT ___ PSIG ___ % SMYS. BASED ON ______.
MAOP OF ___ PSIG AT ___ °F IS LIMITED BY ______.
MINIMUM TEST PRESSURE ___ PSIG. MAXIMUM TEST PRESSURE ___ PSIG.
TEST LIMITED BY ______. TEST PERIOD ___ HOURS.
TEST MEDIUM ______. SERVICE ______.
NONDESTRUCTIVE INSPECTION REQUIREMENTS

CERTIFICATE
TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.
DESIGN ENGINEER DATE
NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

NO.	REVISIONS	BY	DATE
1	ISSUED FOR BID-ADDENDUM #2	MM	09/2018
–	–	–	–

DWG. NO.	REFERENCE
D7261-ARD-021	ACCESS ROAD DETAIL
D7261-ARD-020	ACCESS ROAD DETAIL
D7261-ARD-019	ACCESS ROAD DETAIL
D7261-ALG-018	ALIGNMENT SHEET
D7261-ALG-017	ALIGNMENT SHEET
D7261-ALG-016	ALIGNMENT SHEET

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

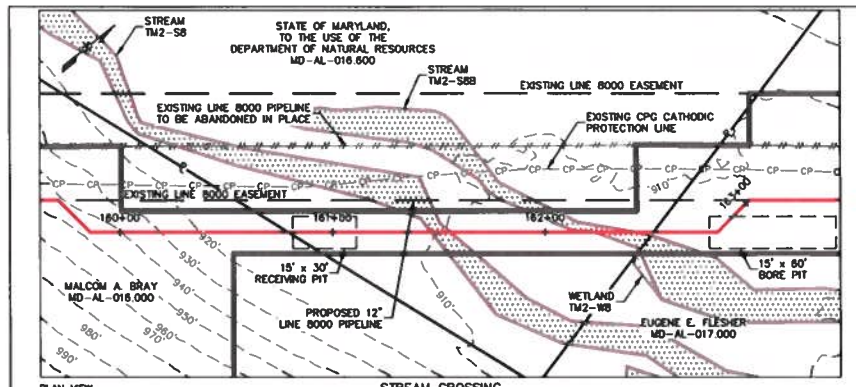
Columbia Gas Transmission

LINE 8000 REPLACEMENT PROJECT

TITLE: PROPOSED 12" HORIZONTAL DIRECTION DRILL
ALLEGANY COUNTY, MARYLAND

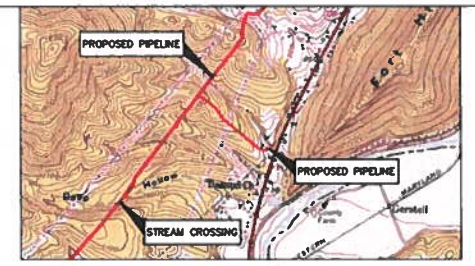
PROJECT NUMBER: M.000688.2
W.O. NUMBER: 5120949
DRAWING NUMBER: D7261-HDD-002
ISSUE: BA

DRAWING NUMBER	ISSUE
D7261-ENV-002	B



PLAN VIEW
SCALE: 1" = 40'

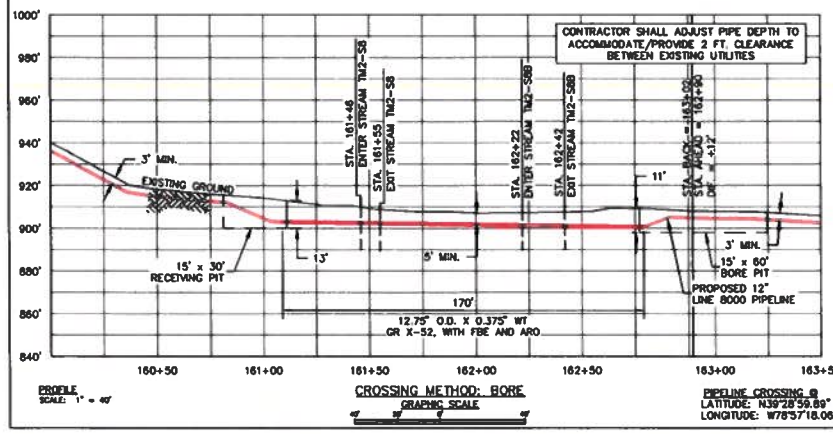
STREAM CROSSING
GRAPHIC SCALE
40' 0 40' 80'



LOCATION MAP
ALLEGANY COUNTY, MARYLAND
SCALE: 1" = 2,000'

GENERAL NOTES:

1. THE PROPOSED PIPELINE INSTALLATION METHOD SHALL BE JACK AND BORE.
2. CONTRACTOR TO LOCATE, MARK, AND FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET COVER OVER PIPELINE WITHIN THE LIMITS OF THE STREAM/WETLAND.
4. CONTRACTOR SHALL REFER TO THE E&S DRAWINGS FOR ADDITIONAL DETAILS ON CROSSING.



PROFILE
SCALE: 1" = 40'

CROSSING METHOD: BORE
GRAPHIC SCALE
40' 0 40' 80'

PIPELINE CROSSING @
LATITUDE: N39°28'59.89"
LONGITUDE: W78°57'18.06"

UNCASED CROSSING
PIPE SPECIFICATIONS

SIZE - 12.75" O.D.
MATERIAL - STEEL
WALL THICKNESS - 0.375"
MATERIAL GRADE - X52
MAOP - 500 psig
DESIGN FACTOR - 0.5
PIPE COATING - FBE AND ARO

ISSUED FOR BID
ADDENDUM #5
10/09/18

MARYLAND DOT ESPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
STREAM TM2-S8 AND TM2-S8B

TAX DISTRICT(S):

CONSULTANT	ENGINEER	FIELD BOOK
MM	MM	PAGE
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET 07281-ALG-008 & 07281-ALG-007	COUNTY(IES): ALLEGANY
MAP DATE: 10/2018		STATE(S): MARYLAND
DRAWN BY: MM		SHEET NO. 1 OF 2
SCALE: PLAN: AS SHOWN; PROFILE: AS SHOWN	MOTT MACDONALD	DRAWING NO. B7261-ENV-003A

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

PIPELINE NOTES:

1. 12" NOM., O.D. 12.750", 0.375" WT., GR. X52.
2. THE PIPE WILL BE COATED WITH FUSION BONDED EPOXY (FBE) WITH ABRASION RESISTANT OVERLAY (ARO).
3. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) 500 PSIG.
4. THE CATHODIC PROTECTION FOR THE PIPELINE WILL BE PROVIDED BY IMPRESSED CURRENT RECTIFIED WITH A GROUND BED OR MAG ANODES.
5. PIPELINE TO BE INSTALLED AND MAINTAINED PER 49 CFR 192.
6. CONSTRUCTION ACTIVITY SHALL BE IN COMPLIANCE WITH MDE EROSION AND SEDIMENT CONTROL PROGRAM.
7. EXISTING PIPELINE TO BE ABANDONED, WILL BE CLEANED WITH CLEANING PIGS, PLATED AND ABANDONED IN PLACE PER 49 CFR PART 192.727. DISCHARGE TO BE COLLECTED AND DISPOSED OF PROPERLY.
8. ANY SURFACE DISTURBANCE DUE TO TEST PIT/POTHOLE OF EXISTING UTILITIES SHALL BE REPAIRED IN ACCORDANCE WITH LOCAL STATE/COUNTY/TOWNSHIP AUTHORITIES.
9. HORIZONTAL AND VERTICAL DATUM BASED ON NAD83 MARYLAND STATE PLANES, NAVD88.
10. PROPERTY LINES SHOWN ON THESE SHEETS ARE APPROXIMATE AND NOT BASED ON A BOUNDARY SURVEY.
11. THIS SURVEY WAS CONDUCTED BY MOTT MACDONALD, IN SEPTEMBER 2017.

UTILITY NOTES:

1. THE UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. IT IS THE RESPONSIBILITY OF CONTRACTORS TO UNCOVER AND VERIFY THE LOCATION OF THE UNDERGROUND UTILITIES.
2. PIPELINE SHALL BE REGISTERED WITH MARYLAND ONE CALL SYSTEM: 1-800-257-7777
3. ALL FERROUS PIPE SURFACES SHALL BE PROTECTED AGAINST CORROSION BY A COMBINATION OF FACTORY APPLIED COATING(S) WITH RELATED FIELD MEASURES AS REQUIRED AND A CATHODIC PROTECTION SYSTEM.
4. ALL JOINTS SHALL BE PROTECTED AND ELECTRICALLY INSULATED FROM THE SURROUNDING SOIL IN A MANNER AT LEAST EQUIVALENT TO THE PROTECTION AND INSULATION GIVEN TO THE PIPE PROPER.
5. PROTECTION SHALL BE PROVIDED TO THE COATED SURFACE OF THE PIPE BY HAVING A MILL APPLIED COATING AS APPROPRIATED TO THE PIPE SIZE.

LEGEND

- WETLAND
- STREAM
- PROPOSED PIPELINE
- EXISTING PIPELINE
- OVERHEAD LINE
- EXISTING FENCE LINE
- PROPOSED FENCE
- EXISTING PROPERTY LINE
- ROAD CENTERLINE
- EXISTING ROAD R.O.W.
- EXISTING GUARDRAIL
- LIMITS OF CONSTRUCTION
- EXISTING UTILITY POLE
- PROPOSED PIPELINE MARKER
- EXISTING PIPELINE MARKER
- EXISTING GAS LDC

ISSUED FOR BID
DATE: 08/2018

MARYLAND DOT ESPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
STREAM TM2-S8 AND TM2-S8B

TAX DISTRICT(S):

CONSULTANT	ENGINEER	FIELD BOOK
MM	MM	PAGE
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET 07281-ALG-008 & 07281-ALG-007	COUNTY(IES): ALLEGANY
MAP DATE: 06/2018		STATE(S): MARYLAND
DRAWN BY: MM		SHEET NO. 2 OF 2
SCALE: PLAN: AS SHOWN; PROFILE: AS SHOWN	MOTT MACDONALD	DRAWING NO. B7261-ENV-003B

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

PLANS APPROVED BY: _____
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ISSUED FOR BID
DATE: 08/2018

MOTT MACDONALD
134 CAPITAL DRIVE SUITE D
WEST SPRINGFIELD MA 01089
UNITED STATES
413-439-6135
INFO@MOTTMAC.COM

NON-SCALED

DESIGN PRESSURE ___ PSIG AT ___ °F (___DESIGN FACTOR). MAXIMUM HOOP STRESS LEVEL AT ___ PSIG ___% SMYS. BASED ON _____.
MAOP OF ___ PSIG AT ___ °F IS LIMITED BY _____.
MINIMUM TEST PRESSURE ___ PSIG. MAXIMUM TEST PRESSURE ___ PSIG.
TEST LIMITED BY _____. TEST PERIOD ___ HOURS.
TEST MEDIUM _____. SERVICE _____.
NONDESTRUCTIVE INSPECTION REQUIREMENTS _____.

CERTIFICATE
TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.

_____ DESIGN ENGINEER _____ DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

NO.	REVISIONS	BY	DATE APPROVED	DATE
B	ISSUED FOR BID	MM	08/2018	
A	–	–	–	
–	–	–	–	

NO.	REVISIONS	BY	DATE APPROVED	DATE
A	–	–	–	
–	–	–	–	

NO.	REVISIONS	BY	DATE APPROVED	DATE
A	–	–	–	
–	–	–	–	

DWG. NO.	REFERENCE

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

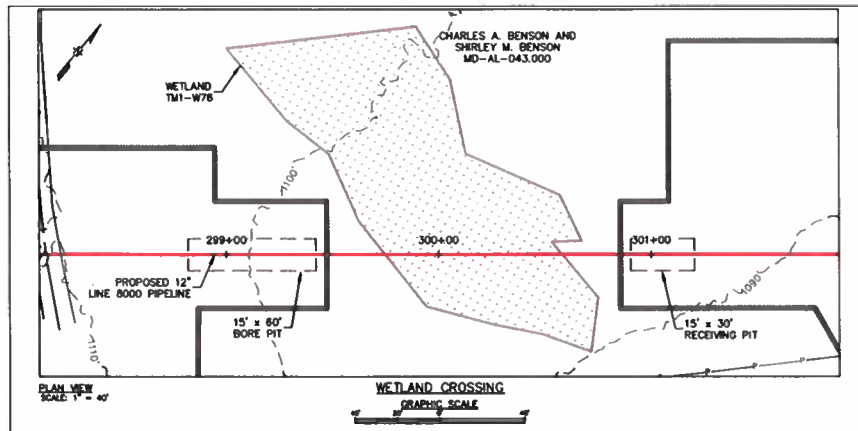
LINE 8000 REPLACEMENT PROJECT

TITLE: PROPOSED 12" PIPELINE ENVIRONMENTAL DETAILS

DRAWN BY	DATE	DRAWING NUMBER	ISSUE
MM	01/2018	D7261-ENV-002	B
PROJECT NUMBER: M.000688.2			
W.O. NUMBER: 5120949			

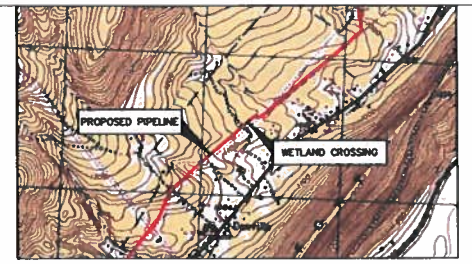
G:\Columbia_385318_Line_8000\Pipeline\Drafting\RailroadCrossings_ProgressPDFs_24x36\Border.dwg
8/13/2018 3:43 PM Division, Anthony C

DRAWING NUMBER	ISSUE
D7261-ENV-003	B



PLAN VIEW
SCALE: 1" = 40'

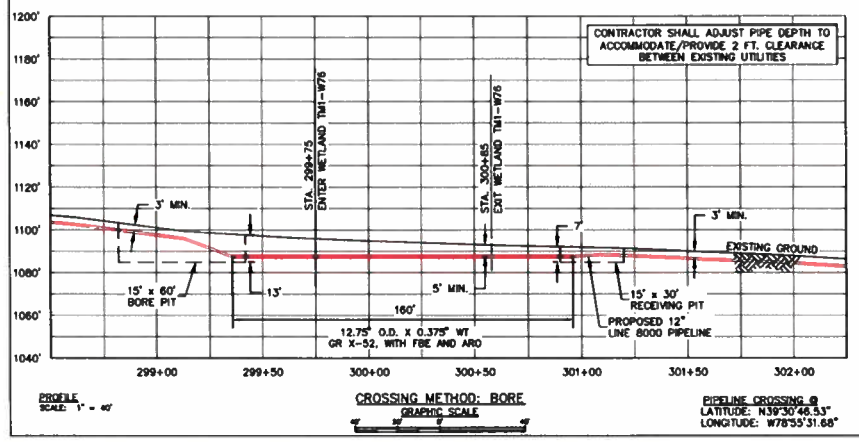
WETLAND CROSSING
GRAPHIC SCALE
40' 20' 0 40'



LOCATION MAP
ALLEGANY COUNTY, MARYLAND
SCALE: 1" = 2,000'

GENERAL NOTES:

1. THE PROPOSED PIPELINE INSTALLATION METHOD SHALL BE JACK AND BORE.
2. CONTRACTOR TO LOCATE, MARK, AND FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET COVER OVER PIPELINE WITHIN THE LIMITS OF THE STREAM/WETLAND.
4. CONTRACTOR SHALL REFER TO THE E&S DRAWINGS FOR ADDITIONAL DETAILS ON CROSSING.



PROFILE
SCALE: 1" = 40'

CROSSING METHOD: BORE
GRAPHIC SCALE
40' 20' 0 40'

PIPELINE CROSSING @
LATITUDE: N39°30'46.53"
LONGITUDE: W78°55'31.68"

UNCASED CROSSING
PIPE SPECIFICATIONS

SIZE - 12.75" O.D.
MATERIAL - STEEL
WALL THICKNESS - 0.375"
MATERIAL GRADE - X52
MAOP - 500 psig
DESIGN FACTOR - 0.5
PIPE COATING - FBE AND ARO

ISSUED FOR BID
DATE: 08/2018

MARYLAND DOT EPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
TM1-W78

TAX DISTRICT(S):

CONSULTANT	ENGINEER	FIELD BOOK
MM	MM	PAGE
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET 07281-ALG-012	COUNTY(IES): ALLEGANY
MAP DATE: 08/2018		STATE(S): MARYLAND
DRAWN BY: MM		SHEET NO.: 1 OF 2
SCALE: PLAN AS SHOWN, PROFILE AS SHOWN	MOTT MACDONALD	DRAWING NO.: B7261-ENV-004A

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE CHARLESTON, WV 25314

PIPELINE NOTES:

1. 12" NOM., O.D. 12.750", 0.375" WT., GR. X52.
2. THE PIPE WILL BE COATED WITH FUSION BONDED EPOXY (FBE) WITH ABRASION RESISTANT OVERLAY (ARO).
3. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) 500 PSIG.
4. THE CATHODIC PROTECTION FOR THE PIPELINE WILL BE PROVIDED BY IMPRESSED CURRENT RECTIFIED WITH A GROUND BED OR MAG ANODES.
5. PIPELINE TO BE INSTALLED AND MAINTAINED PER 49 CFR 192.
6. CONSTRUCTION ACTIVITY SHALL BE IN COMPLIANCE WITH MDE EROSION AND SEDIMENT CONTROL PROGRAM.
7. EXISTING PIPELINE TO BE ABANDONED, WILL BE CLEANED WITH CLEANING PIGS, PLATED AND ABANDONED IN PLACE PER 49 CFR PART 192.727. DISCHARGE TO BE COLLECTED AND DISPOSED OF PROPERLY.
8. ANY SURFACE DISTURBANCE DUE TO TEST PIT/POTHOLE OF EXISTING UTILITIES SHALL BE REPAIRED IN ACCORDANCE WITH LOCAL STATE/COUNTY/TOWNSHIP AUTHORITIES.
9. HORIZONTAL AND VERTICAL DATUM BASED ON NAD83 MARYLAND STATE PLANES, NAVD88.
10. PROPERTY LINES SHOWN ON THESE SHEETS ARE APPROXIMATE AND NOT BASED ON A BOUNDARY SURVEY.
11. THIS SURVEY WAS CONDUCTED BY MOTT MACDONALD, IN SEPTEMBER 2017.

UTILITY NOTES:

1. THE UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. IT IS THE RESPONSIBILITY OF CONTRACTORS TO UNCOVER AND VERIFY THE LOCATION OF THE UNDERGROUND UTILITIES.
2. PIPELINE SHALL BE REGISTERED WITH MARYLAND ONE CALL SYSTEM: 1-800-257-7777
3. ALL FERROUS PIPE SURFACES SHALL BE PROTECTED AGAINST CORROSION BY A COMBINATION OF FACTORY APPLIED COATING(S) WITH RELATED FIELD MEASURES AS REQUIRED AND A CATHODIC PROTECTION SYSTEM.
4. ALL JOINTS SHALL BE PROTECTED AND ELECTRICALLY INSULATED FROM THE SURROUNDING SOIL IN A MANNER AT LEAST EQUIVALENT TO THE PROTECTION AND INSULATION GIVEN TO THE PIPE PROPER.
5. PROTECTION SHALL BE PROVIDED TO THE COATED SURFACE OF THE PIPE BY HAVING A MILL APPLIED COATING AS APPROPRIATED TO THE PIPE SIZE.

LEGEND

- WETLAND
- STREAM
- PROPOSED PIPELINE
- EXISTING PIPELINE
- OVERHEAD LINE
- EXISTING FENCE LINE
- PROPOSED FENCE
- EXISTING PROPERTY LINE
- ROAD CENTERLINE
- EXISTING ROAD R.O.W.
- EXISTING GUARDRAIL
- LIMITS OF CONSTRUCTION
- EXISTING UTILITY POLE
- PROPOSED PIPELINE MARKER
- EXISTING PIPELINE MARKER
- EXISTING GAS LDC

ISSUED FOR BID
DATE: 08/2018

MARYLAND DOT EPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
TM1-W78

TAX DISTRICT(S):

CONSULTANT	ENGINEER	FIELD BOOK
MM	MM	PAGE
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET 07281-ALG-012	COUNTY(IES): ALLEGANY
MAP DATE: 08/2018		STATE(S): MARYLAND
DRAWN BY: MM		SHEET NO.: 2 OF 2
SCALE: PLAN AS SHOWN, PROFILE AS SHOWN	MOTT MACDONALD	DRAWING NO.: B7261-ENV-004B

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE CHARLESTON, WV 25314

PLANS APPROVED BY: [signature]
DATE: 2/14/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ISSUED FOR BID
DATE: 08/2018

MOTT MACDONALD
134 CAPITAL DRIVE SUITE G
WEST SPRINGFIELD MA 01089
UNITED STATES
+413-536-9138
INFO@MOTTMAC.COM

NON-SCALED

DESIGN PRESSURE ___ PSIG AT ___ °F (___ DESIGN FACTOR). MAXIMUM HOOP STRESS LEVEL AT ___ PSIG ___ % SMYS. BASED ON ___
MAOP OF ___ PSIG AT ___ °F IS LIMITED BY ___
MINIMUM TEST PRESSURE ___ PSIG. MAXIMUM TEST PRESSURE ___ PSIG.
TEST LIMITED BY ___ TEST PERIOD ___ HOURS.
TEST MEDIUM ___ SERVICE ___
NONDESTRUCTIVE INSPECTION REQUIREMENTS ___

CERTIFICATE
TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.

DESIGN ENGINEER — DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

NO.	REVISIONS	BY APPROVED	DATE
B	ISSUED FOR BID	MM	08/2018
A	–	–	–
1	–	–	–

DWG. NO.	REFERENCE

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

LINE 8000 REPLACEMENT PROJECT

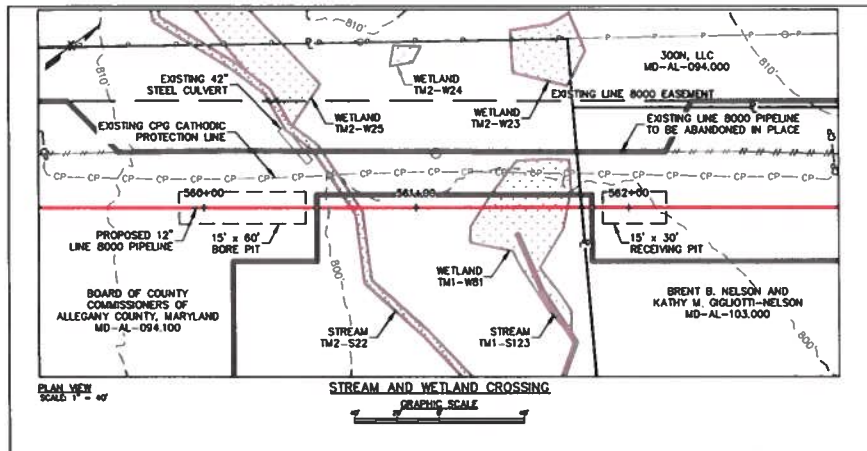
TITLE: PROPOSED 12" PIPELINE ENVIRONMENTAL DETAILS

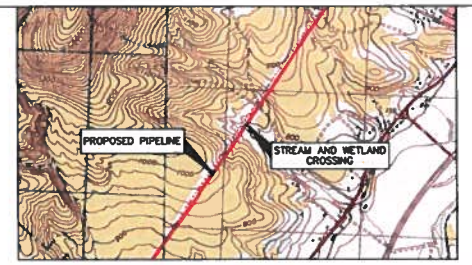
DRAWN BY	DATE	DRAWING NUMBER	ISSUE
MM	01/2018	D7261-ENV-003	B

PROJECT NUMBER: M.000688.2
W.O. NUMBER: 5120949

G:\Columbia_386318_Line_8000_Pipeline_Drafting_RailroadCrossings_ProgressPDFs_24x36_Border.dwg
8/13/2018 3:43 PM Davison, Anthony C

DRAWING NUMBER	ISSUE
D7261-ENV-004	B

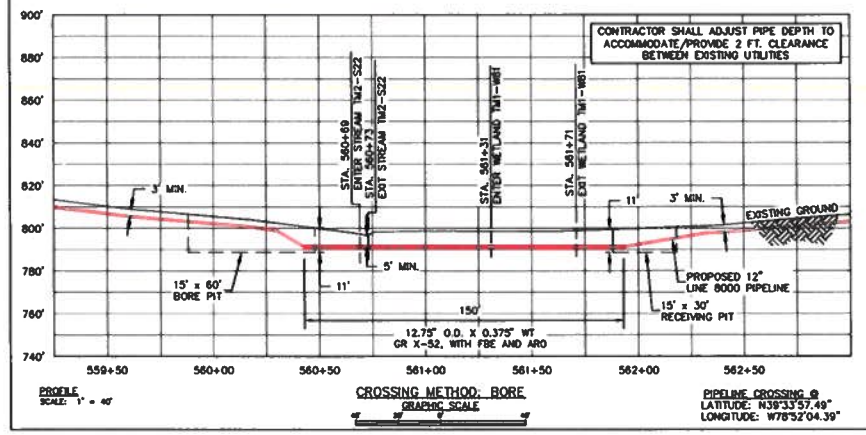




LOCATION MAP
ALLEGANY COUNTY, MARYLAND
SCALE: 1" = 2,000'

GENERAL NOTES:

1. THE PROPOSED PIPELINE INSTALLATION METHOD SHALL BE JACK AND BORE.
2. CONTRACTOR TO LOCATE, MARK, AND FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
3. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET COVER OVER PIPELINE WITHIN THE LIMITS OF THE STREAM/WETLAND.
4. CONTRACTOR SHALL REFER TO THE E&S DRAWINGS FOR ADDITIONAL DETAILS ON CROSSING.



PIPELINE CROSSING @
LATITUDE: N39°33'57.49"
LONGITUDE: W78°52'04.39"

UNCASED CROSSING
PIPE SPECIFICATIONS

SIZE - 12.75" O.D.
MATERIAL - STEEL
WALL THICKNESS - 0.375"
MATERIAL GRADE - X52
MAOP - 500 psig
DESIGN FACTOR - 0.5
PIPE COATING - FBE AND ARO

ISSUED FOR BID
DATE: 08/2018

MARYLAND DOT SPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE: (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
STREAM TM2-S22 AND WETLAND TM1-W81

TAX DISTRICT/S:

CONSULTANT	ENGINEER	FIELD BOOK	COUNTY/IES
MM	MM	PAGE	ALLEGANY
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET D7261-ALG-021		STATE/S: MARYLAND
MAP DATE: 08/2018			SHEET NO. 1 OF 2
DRAWN BY: MM			DRAWING NO. B7261-ENV-005A

SCALE: PLAN AS SHOWN, PROFILE AS SHOWN

MOTT MACDONALD

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

PIPELINE NOTES:

1. 12" NOM., O.D. 12.750", 0.375" WT., GR. X52.
2. THE PIPE WILL BE COATED WITH FUSION BONDED EPOXY (FBE) WITH ABRASION RESISTANT OVERLAY (ARO).
3. MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) 500 PSIG.
4. THE CATHODIC PROTECTION FOR THE PIPELINE WILL BE PROVIDED BY IMPRESSED CURRENT RECTIFIED WITH A GROUND BED OR MAG ANODES.
5. PIPELINE TO BE INSTALLED AND MAINTAINED PER 49 CFR 192.
6. CONSTRUCTION ACTIVITY SHALL BE IN COMPLIANCE WITH MDE EROSION AND SEDIMENT CONTROL PROGRAM.
7. EXISTING PIPELINE TO BE ABANDONED, WILL BE CLEANED WITH CLEANING PIGS, PLATED AND ABANDONED IN PLACE PER 49 CFR PART 192.727. DISCHARGE TO BE COLLECTED AND DISPOSED OF PROPERLY.
8. ANY SURFACE DISTURBANCE DUE TO TEST PIT/POTHOLE OF EXISTING UTILITIES SHALL BE REPAIRED IN ACCORDANCE WITH LOCAL STATE/COUNTY/TOWNSHIP AUTHORITIES.
9. HORIZONTAL AND VERTICAL DATUM BASED ON NAD83 MARYLAND STATE PLANES, NAVD88.
10. PROPERTY LINES SHOWN ON THESE SHEETS ARE APPROXIMATE AND NOT BASED ON A BOUNDARY SURVEY.
11. THIS SURVEY WAS CONDUCTED BY MOTT MACDONALD, IN SEPTEMBER 2017.

UTILITY NOTES:

1. THE UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE APPROXIMATE AND ALL UTILITIES MAY NOT BE SHOWN. IT IS THE RESPONSIBILITY OF CONTRACTORS TO UNCOVER AND VERIFY THE LOCATION OF THE UNDERGROUND UTILITIES.
2. PIPELINE SHALL BE REGISTERED WITH MARYLAND ONE CALL SYSTEM: 1-800-257-7777
3. ALL FERROUS PIPE SURFACES SHALL BE PROTECTED AGAINST CORROSION BY A COMBINATION OF FACTORY APPLIED COATING(S) WITH RELATED FIELD MEASURES AS REQUIRED AND A CATHODIC PROTECTION SYSTEM.
4. ALL JOINTS SHALL BE PROTECTED AND ELECTRICALLY INSULATED FROM THE SURROUNDING SOIL IN A MANNER AT LEAST EQUIVALENT TO THE PROTECTION AND INSULATION GIVEN TO THE PIPE PROPER.
5. PROTECTION SHALL BE PROVIDED TO THE COATED SURFACE OF THE PIPE BY HAVING A WELL APPLIED COATING AS APPROPRIATED TO THE PIPE SIZE.

LEGEND

- WETLAND
- STREAM
- PROPOSED PIPELINE
- EXISTING PIPELINE
- OVERHEAD LINE
- EXISTING FENCE LINE
- PROPOSED FENCE
- EXISTING PROPERTY LINE
- ROAD CENTERLINE
- EXISTING ROAD R.O.W.
- EXISTING GUARDRAIL
- LIMITS OF CONSTRUCTION
- EXISTING UTILITY POLE
- PROPOSED PIPELINE MARKER
- EXISTING PIPELINE MARKER
- EXISTING GAS LDC

ISSUED FOR BID
DATE: 08/2018

MARYLAND DOT SPS APP. NO.	MARYLAND DOT HOP NO.
N/A	N/A

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE: (304) 357-2000

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
BORE CROSSING OF
STREAM TM2-S22 AND WETLAND TM1-W81

TAX DISTRICT/S:

CONSULTANT	ENGINEER	FIELD BOOK	COUNTY/IES
MM	MM	PAGE	ALLEGANY
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET D7261-ALG-021		STATE/S: MARYLAND
MAP DATE: 08/2018			SHEET NO. 2 OF 2
DRAWN BY: MM			DRAWING NO. B7261-ENV-005B

SCALE: PLAN AS SHOWN, PROFILE AS SHOWN

MOTT MACDONALD

Columbia Gas Transmission
PROJECT DELIVERY
PROJECT ENGINEERING

PLANS APPROVED BY: _____
DATE: 4/14/18
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ISSUED FOR BID
DATE: 08/2018

NO.	REVISIONS	BY	DATE
B	ISSUED FOR BID	MM	08/2018
A	–	–	–
–	–	–	–

NO.	REVISIONS	BY	DATE
A	–	–	–
–	–	–	–

NO.	REVISIONS	BY	DATE
A	–	–	–
–	–	–	–

MOTT MACDONALD
134 CAPITAL DRIVE SUITE D
WEST SPRINGFIELD MA 01089
UNITED STATES
413-439-8135
INFO@MOTTMAC.COM

NON-SCALED

DESIGN PRESSURE ___ PSIG AT ___ °F (___ DESIGN FACTOR). MAXIMUM HOOP STRESS LEVEL AT ___ PSIG ___ % SMYS. BASED ON _____.
MAOP OF ___ PSIG AT ___ °F IS LIMITED BY _____.
MINIMUM TEST PRESSURE ___ PSIG. MAXIMUM TEST PRESSURE ___ PSIG.
TEST LIMITED BY _____. TEST PERIOD ___ HOURS.
TEST MEDIUM _____. SERVICE _____.
NONDESTRUCTIVE INSPECTION REQUIREMENTS _____.

CERTIFICATE
TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.

DESIGN ENGINEER — DATE

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

DWG. NO. REFERENCE

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

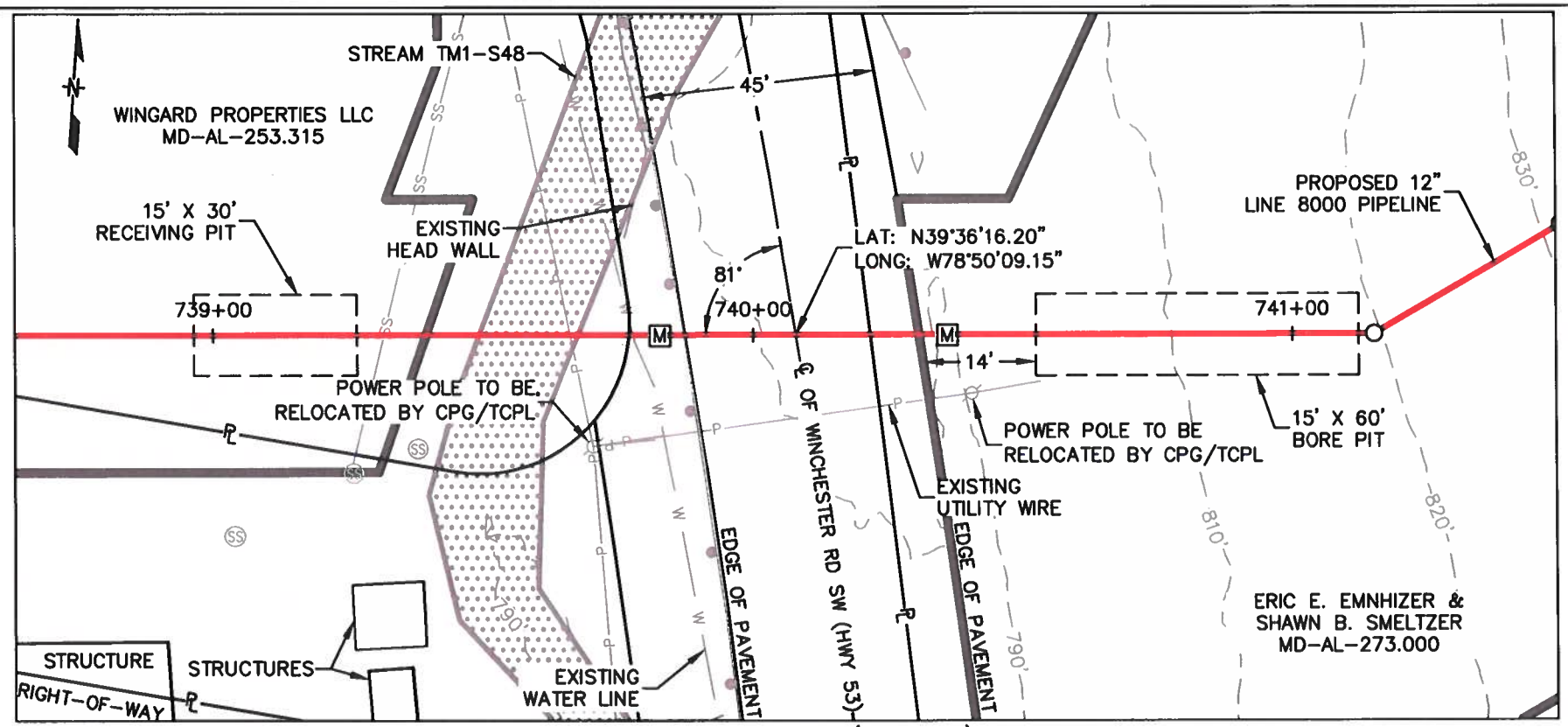
Columbia Gas Transmission

LINE 8000 REPLACEMENT PROJECT

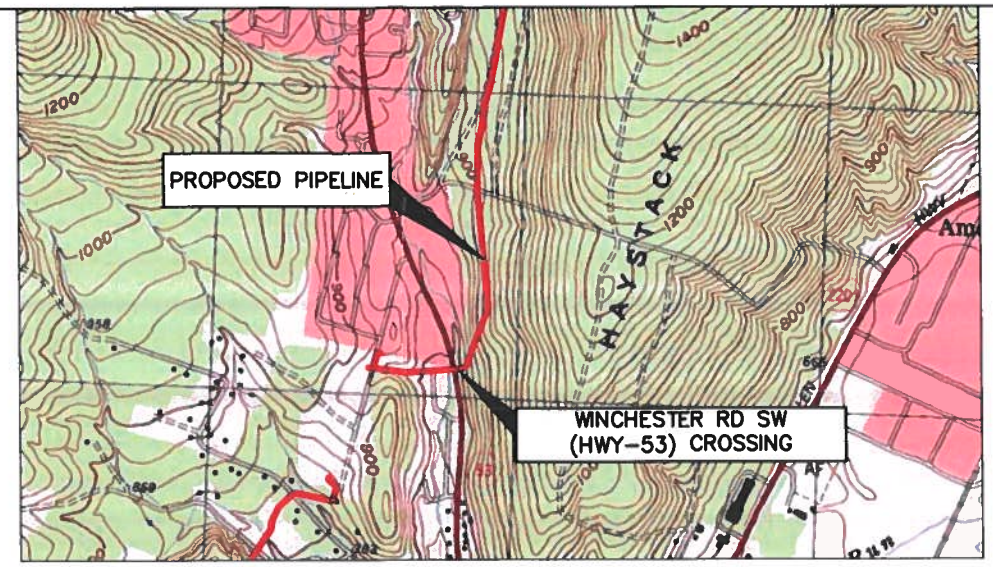
TITLE: PROPOSED 12" PIPELINE ENVIRONMENTAL DETAILS

DRAWN BY	DATE	DRAWING NUMBER	ISSUE
MM	01/2018	D7261-ENV-004	B
PROJECT NUMBER:	M.000688.2		
W.O. NUMBER:	5120949		

G:\Columbia_365318_Line_8000\Pipeline\Drafting\RailroadCrossings_ProgressPDFs_24x36\Border.dwg
8/13/2018 3:43 PM Davison, Anthony C



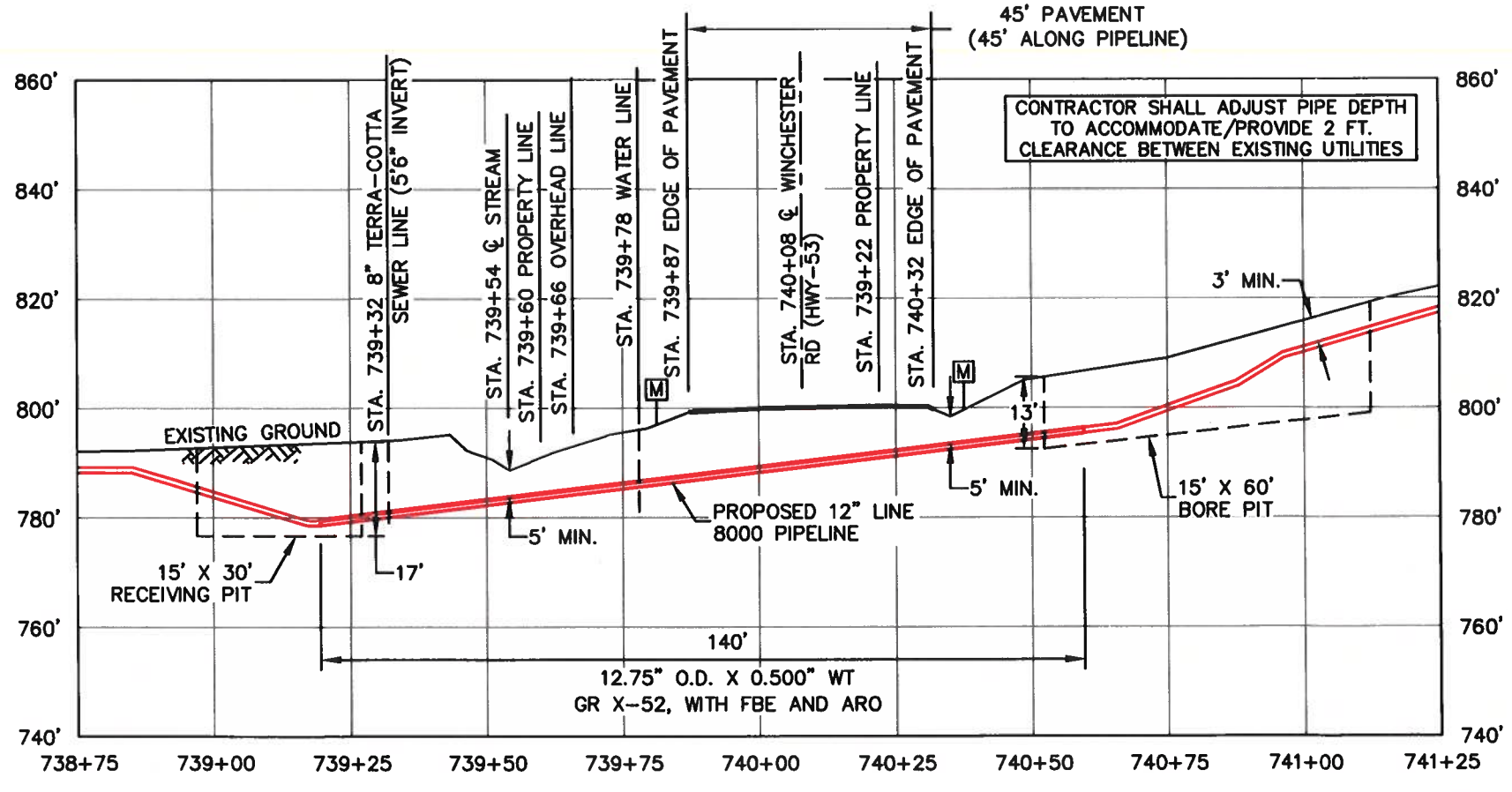
PLAN VIEW
SCALE: 1" = 30'



LOCATION MAP
ALLEGANY COUNTY, MARYLAND
SCALE: 1" = 2,000'

GENERAL NOTES:

1. THIS DRAWING IS FOR PERMITTING PURPOSES.
2. ALL WORK AND MATERIALS WITHIN PUBLIC RIGHT-OF-WAY MUST CONFORM TO MDOT REGULATIONS AND STANDARDS.
3. THE PROPOSED PIPELINE INSTALLATION METHOD SHALL BE JACK AND BORE. NO IMPACTS TO THE PAVEMENT STRUCTURE ARE ANTICIPATED.
4. CONTRACTOR TO LOCATE, MARK, AND FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.
5. LINE MARKERS WILL BE LOCATED AT THE ROAD RIGHT-OF-WAY LINES INDICATING THE ADDRESS AND TELEPHONE NUMBER OF OPERATOR AND THAT THE FACILITY IS A NATURAL GAS PIPELINE.
6. TRAFFIC CONTROL DURING CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE APPROPRIATE MDOT SHA UTILITY POLICY.
7. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET COVER OVER PIPELINE WITHIN THE LIMITS OF THE ROAD RIGHT-OF-WAY.
8. BACKFILL BORE AND RECEIVING PITS IN COMPACTED LIFTS SO AS TO PREVENT INFILTRATION OF GROUNDWATER ALONGSIDE PIPE UNDER ROADWAY. BACKFILL PROPOSED BORE AND RECEIVING PITS AND PIPELINE ACCORDING TO MDOT SPECIFICATIONS.
9. ALL DISTURBED AREAS OUTSIDE OF PAVEMENT OR SHOULDER SHALL BE RESTORED TO A CONDITION AT LEAST EQUAL TO THAT WHICH EXISTED PRIOR TO THE START OF WORK.



PROFILE
SCALE: H: 1" = 30'

CROSSING METHOD: BORE
GRAPHIC SCALE
30' 15' 0' 30'

PIPELINE CROSSING @
LATITUDE: N39°36'16.20"
LONGITUDE: W78°50'09.15"

UNCASED CROSSING
PIPE SPECIFICATIONS

SIZE - 12.75" O.D.
MATERIAL - STEEL
WALL THICKNESS - 0.500"
MATERIAL GRADE - X52
MAOP - 500 psig
DESIGN FACTOR - 0.5
PIPE COATING - FBE AND ARO

PLANS APPROVED BY: _____
DATE: 2/19/18
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ISSUED FOR BID
DATE: 08/2018

24/7 CONTACT AND PIPELINE MARKER INFO
COLUMBIA PIPELINE GROUP
P.O. BOX 1273
CHARLESTON, WV 25325-1273
EMERGENCY PHONE: (304) 357-2000

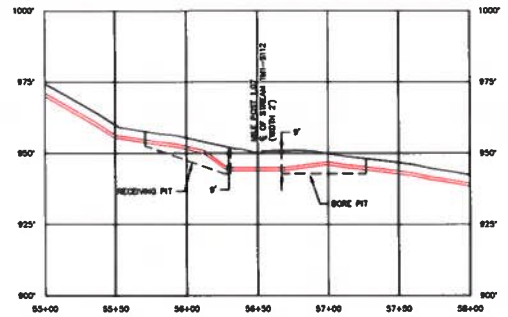
MARYLAND DOT EPS APP. NO.	MARYLAND DOT HOP NO.

LINE 8000 REPLACEMENT PROJECT
PROPOSED 12" PIPELINE
CROSSING OF
WINCHESTER RD SW (HWY-53)

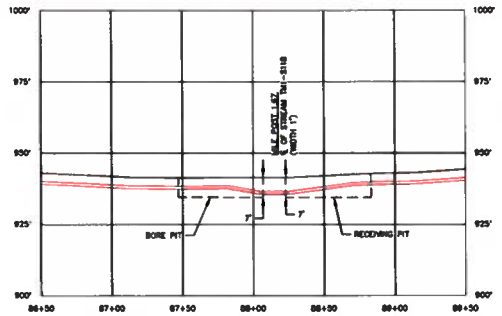
TAX DISTRICT(S)

CONSULTANT: MM	ENGINEER: MM	FIELD BOOK: ____ PAGE: ____	COUNTY(IES): ALLEGANY
SURVEY DATE: 09/2017	REFERENCES: ALIGNMENT SHEET D7261-ALG-026		
MAP DATE: 08/2018	M MOTT MACDONALD	Columbia Gas Transmission PROJECT DELIVERY PROJECT ENGINEERING P.O. BOX 1273 CHARLESTON, WV 25325-1273 1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314	STATE(S): MARYLAND
DRAWN BY: MM			SHEET NO. 1 OF 2
SCALE PLAN: AS SHOWN PROFILE: AS SHOWN			DRAWING NO. B7261-RXP-019A

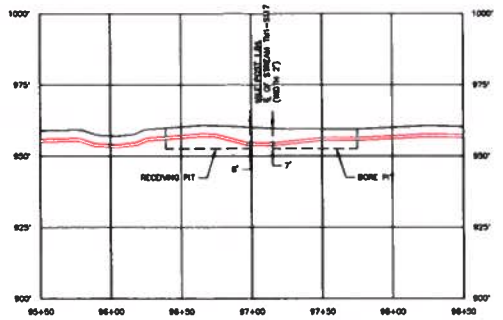
DRAWING NUMBER	ISSUE
D7261-ENV-005	BB



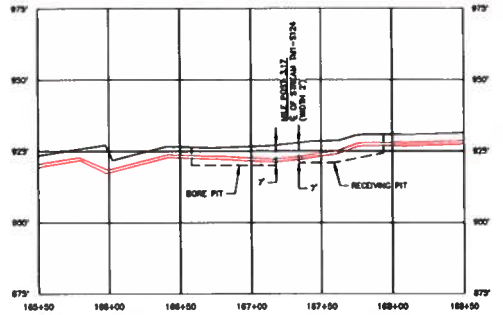
PROPOSED 12" PIPELINE
STREAM TM1-S112 CROSSING
CROSSING METHOD: BORE



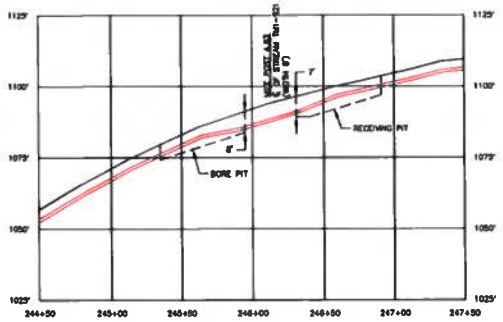
PROPOSED 12" PIPELINE
STREAM TM1-S118 CROSSING
CROSSING METHOD: BORE



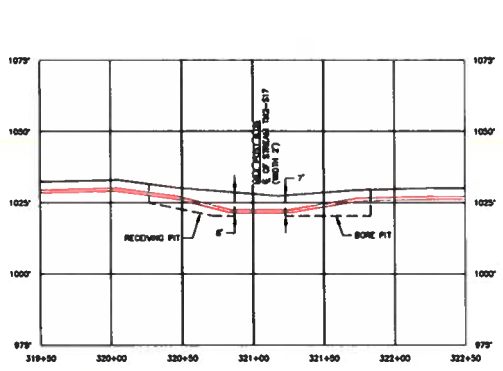
PROPOSED 12" PIPELINE
STREAM TM1-S117 CROSSING
CROSSING METHOD: BORE



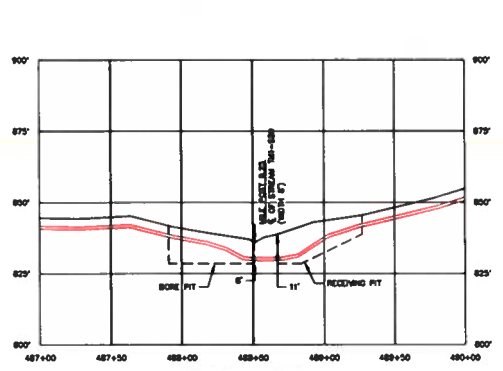
PROPOSED 12" PIPELINE
STREAM TM1-S124 CROSSING
CROSSING METHOD: BORE



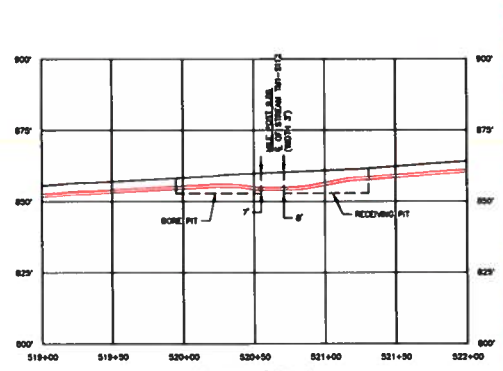
PROPOSED 12" PIPELINE
STREAM TM1-S121 CROSSING
CROSSING METHOD: BORE



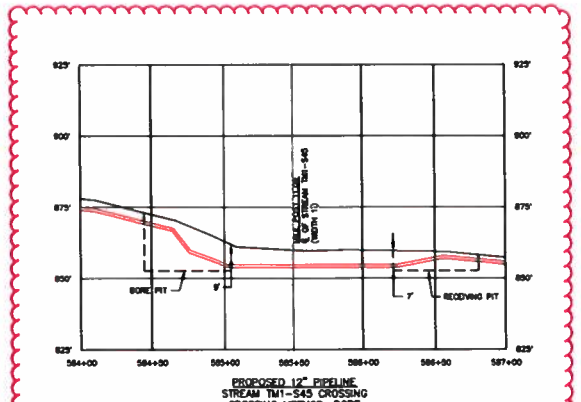
PROPOSED 12" PIPELINE
STREAM TM2-S17 CROSSING
CROSSING METHOD: BORE



PROPOSED 12" PIPELINE
STREAM TM1-S89 CROSSING
CROSSING METHOD: BORE



PROPOSED 12" PIPELINE
STREAM TM1-S122 CROSSING
CROSSING METHOD: BORE



PROPOSED 12" PIPELINE
STREAM TM1-S43 CROSSING
CROSSING METHOD: BORE

PLANS APPROVED BY: _____
DATE: 2/19/19
WATER AND SCIENCE ADMINISTRATION
WATERWAY CONSTRUCTION DIVISION
MARYLAND DEPARTMENT OF THE ENVIRONMENT

ISSUED FOR BID
ADDENDUM #5
10/09/18

NOTES:

CONTRACTOR SHALL REFERENCE "APPENDIX I - TABLE 2 - STREAM/WATERBODY CROSSINGS" IN THE SCOPE OF WORK FOR THE CROSSING FOR ALL STREAMS AND CONSTRUCTION SCHEDULE/TIME OF YEAR RESTRICTIONS.

PROFILE
HORIZ: 1" = 60'
VERT: 1" = 30'

SCALE: 1" = 60'-0"

M MOTT MACDONALD
134 CAPITAL DRIVE SUITE D
WEST SPRINGFIELD MA 01089
UNITED STATES
413-535-6135
INFO@MOTTMAC.COM

DESIGN PRESSURE ___ PSIG AT ___ % (___ DESIGN FACTOR), MAXIMUM HOOP STRESS LEVEL AT ___ PSIG ___ % SMYS, BASED ON _____.
MAOP OF ___ PSIG AT ___ % IS LIMITED BY _____.
MINIMUM TEST PRESSURE ___ PSIG. MAXIMUM TEST PRESSURE ___ PSIG.
TEST LIMITED BY _____. TEST PERIOD ___ HOURS.
TEST MEDIUM _____. SERVICE _____.
NONDESTRUCTIVE INSPECTION REQUIREMENTS _____.

CERTIFICATE
TO THE BEST OF MY KNOWLEDGE, ALL COMPONENTS OF THIS DRAWING ARE DESIGNED IN ACCORDANCE WITH APPLICABLE COLUMBIA GUIDELINES AND SPECIFICATIONS.

DESIGN ENGINEER _____ DATE _____

NOTE: ANY CHANGES TO THE DESIGN SHOWN ON THIS DRAWING MUST BE APPROVED BY THE DESIGN ENGINEER.

NO.	REVISIONS	BY APPROVED	DATE
BB	ISSUED FOR BID-ADDENDUM #5	MM	10/2018

NO.	REVISIONS	BY APPROVED	DATE

NO.	REVISIONS	BY APPROVED	DATE

DWG. NO.	REFERENCE

PROJECT DELIVERY
PROJECT ENGINEERING
P.O. BOX 1273 CHARLESTON, WV 25325-1273
1700 MACCORKLE AVENUE SE, CHARLESTON, WV 25314

Columbia Gas Transmission

LINE 8000 REPLACEMENT PROJECT

TITLE: PROPOSED 12" PIPELINE
ENVIRONMENTAL CROSSING PROFILES

DRAWN BY	DATE	DRAWING NUMBER	ISSUE
MM	10/2018	D7261-ENV-005	BB

PROJECT NUMBER: M.000688.2
W.O. NUMBER: 5120949